

SANbox2-8c Fibre Channel Switch Installation Guide

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Notes

Section 1

Introduction

This manual is organized as follows:

- [Section 1](#) describes the intended audience, related materials, safety notices, communications statements, laser safety information, electrostatic discharge sensitivity precautions, accessible parts, and technical support.
- [Section 2](#) is an overview of the switch. It describes indicator LEDs and all user controls and connections.
- [Section 3](#) describes the factors to consider when planning a fabric.
- [Section 4](#) explains how to install and configure the switch.
- [Section 5](#) describes the diagnostic methods and troubleshooting procedures.
- [Appendix A](#) lists the switch specifications.
- [Appendix B](#) describes the Command Line Interface.

Please read the communications statements and laser safety information later in this section. Use this manual in conjunction with the *SANbox2 Switch Management User's Guide*.

1.1

Intended Audience

This manual introduces users to the switch and explains its installation and service. It is intended for users who are competent in installing and servicing electronic equipment.

1.2

Related Materials

The following manuals and materials are referenced in the text and/or provide additional information.

- *SANbox2 Switch Management User's Guide*, Publication Number 59022-03. Available from QLogic Corporation.
- Fibre Channel-Arbitrated Loop (FC-AL-2) Rev. 6.8
- Fibre Channel-Private Loop SCSI Direct Attach (FC-PLDA) NCITS TR-19:1998
- Fibre Channel-10-bit Interface Rev. 2.3
- Definitions of Managed Objects for the Fabric Element in Fibre Channel Standard (draft-ietf-ipfc-fabric-element-mib-04.txt).

The Fibre Channel Standards are available from:

Global Engineering Documents, 15 Inverness Way East, Englewood, CO
80112-5776 Phone: (800) 854-7179 or (303) 397-7956 Fax: (303)
397-2740

1.3

Safety Notices

A **Warning** notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

4-3, 4-5

A **Caution** notice indicates the presence of a hazard that has the potential of causing damage to the equipment.

4-3

1.4

Sicherheitshinweise

Ein **Warnhinweis** weist auf das Vorhandensein einer Gefahr hin, die möglicherweise mittelschwere oder leichte Verletzungen zur Folge hat.

4-3, 4-6

Ein **Vorsichtshinweis** weist auf das Vorhandensein einer Gefahr hin, die möglicherweise Geräteschäden zur Folge hat.

4-3

1.5

Notes informatives relatives à la sécurité

Une note informative **Avertissement** indique la présence d'un risque pouvant entraîner des blessures légères ou mineures.

4-3, 4-5

Une note informative **Attention** indique la présence d'un risque pouvant entraîner des dégâts matériels.

4-3

1.6

Communications Statements

The following statements apply to this product. The statements for other products intended for use with this product appear in their accompanying manuals.

1.6.1

Federal Communications Commission (FCC) Class A Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause unacceptable interference, in which case the user will be required to correct the interference at their own expense.

Neither the provider nor the manufacturer is responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

1.6.2

Canadian Department of Communications Class A Compliance Statement

This equipment does not exceed Class A limits for radio emissions for digital apparatus, set out in Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps necessary to correct the interference.

1.6.3

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe A d'émission de bruits radioélectriques par les appareils numériques, telles que prescrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entraîner le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur à prendre les dispositions nécessaires pour en éliminer les causes.

1.6.4

CE Statement

The CE symbol on the equipment indicates that this system complies with the EMC (Electromagnetic Compatibility) directive of the European Community (89/336/EEC) and to the Low Voltage (Safety) Directive (73/23/EEC). Such marking indicates that this system meets or exceeds the following technical standards:

- EN60950/A11:1997 – *“Safety of Information Technology Equipment, Including Electrical Business Equipment”*.
- EN60825-1/A11:1996 – *“Safety of Laser Products, Part 1”*.
- EN55022:1998 – *“Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment”*.
- EN55024-1:1998 – *“Electromagnetic compatibility - Generic immunity standard Part 1: Residential commercial, and light industry.”*
 - ☐ IEC1000-4-2:1995 – *“Electrostatic Discharge Immunity Test”*
 - ☐ IEC1000-4-3:1995 – *“Radiated, Radio-Frequency, Electromagnetic Field Immunity Test”*
 - ☐ IEC1000-4-4:1995 – *“Electrical Fast Transient/Burst Immunity Test”*
 - ☐ IEC1000-4-5:1995 – *“Surge Immunity Test”*
 - ☐ IEC1000-4-6:1996 – *“Immunity To Conducted Disturbances, Induced By Radio-Frequency Fields”*
 - ☐ IEC1000-4-8:1993 – *“Power Frequency Magnetic Field Immunity Test”*
 - ☐ IEC1000-4-11:1994 – *“Voltage Dips, Short Interruptions And Voltage Variations Immunity Tests”*
- EN61000-3-2:1995 – *“Limits For Harmonic Current Emissions (Equipment Input Current Less Than/Equal To 16 A Per Phase)” Class A*
- EN61000-3-3:1995 – *“Limitation Of Voltage Fluctuations And Flicker In Low-Voltage Supply Systems For Equipment With Rated Current Less Than Or Equal To 16 A”*

1.6.5

VCCI Class A Statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is a Class A product based on the standard of the Voluntary Control Council For Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

1.6.6

BSMI Class A Statement

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Warning:

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user will be required to take adequate measures.

1.6.7

Laser Safety Information

This product may use Class 1 laser optical transceivers to communicate over the fiber optic conductors. The U.S. Department of Health and Human Services (DHHS) does not consider Class 1 lasers to be hazardous. The International Electrotechnical Commission (IEC) 825 Laser Safety Standard requires labeling in English, German, Finnish, and French stating that the product uses Class 1 lasers. Because it is impractical to label the transceivers, the following label is provided in this manual.



1.7

Electrostatic Discharge Sensitivity (ESDS) Precautions

The assemblies used in the switch chassis are ESD sensitive. Observe ESD handling procedures when handling any assembly used in the switch chassis.

1.8

Accessible Parts

The only Field Replaceable Units (FRUs) are Small Form-Factor Pluggable (SFP) transceivers.

1.9

Pièces Accessibles

Les pièces remplaçables, Field Replaceable Units (FRU), du commutateur sont interfaces aux media d'interconnexion appelés SFP transceivers.

1.10

Zugängliche Teile

Nur die folgenden Teile im können kundenseitig ersetzt werden Schnittstellen für die Zwischenverbindungsträger, SFP transceivers genannt.

1.11

Technical Support

Customers should contact their authorized maintenance provider for technical support of their QLogic switch products. QLogic-direct customers may contact QLogic Technical Support; others will be redirected to their authorized maintenance provider.

Visit the QLogic switch support Web site listed in "[Contact Information](#)" on [page 1-8](#) for the latest firmware and software updates.

1.11.1

Availability

QLogic Technical Support is available from 7:00 AM to 7:00 PM Central Standard Time, Monday through Friday, excluding QLogic-observed holidays.

1.11.2

Training

QLogic offers the following technical training courses:

- Switch Certification
- HBA Certification

Each course is available at the training facility in Eden Prairie, MN or at your local facility. All courses include a Fibre Channel overview and sections on installation, maintenance, and topology solutions. Each student receives a set of manuals and a CD-ROM containing course training materials. Upon successful completion of the training, Qlogic awards a certificate identifying the student as a Certified SANbox® or SANblade™ Professional.

1.11.3

Contact Information

Address:	QLogic Switch Products Inc. 6321 Bury Drive Eden Prairie, Minnesota 55346 USA
Telephone:	+1 952-932-4040
Fax:	+1 952-932-4018
Email:	
Technical Service	support@qlogic.com
Technical Training	tech.training@qlogic.com
Switch Support Web Site:	www.qlogic.com/support/home_support.asp

Section 2

General Description

This section describes the features and capabilities of the SANbox2-8c Fibre Channel Switch. The following topics are described:

- Chassis controls and LEDs
- Fibre channel ports
- Ethernet port
- Serial port
- Power supply and fan
- Fabric management

SANbox2 fabrics are managed with the SANbox Manager switch management application or the Command Line Interface (CLI). Refer to the *SANbox2 Switch Management User's Guide* for information about using SANbox Manager. Refer to [Appendix B](#) for information about using the CLI.

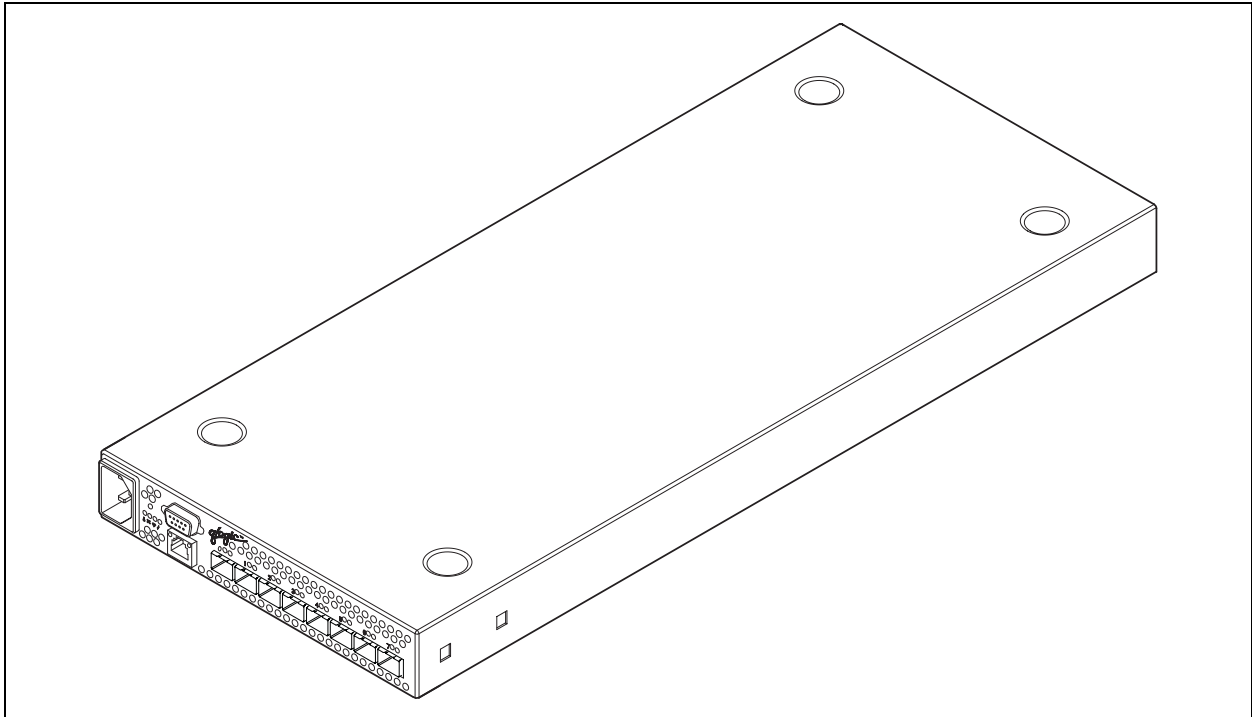


Figure 2-1. SANbox2-8c Fibre Channel Switch

2.1

Chassis Controls and LEDs

The Reset/Force PROM button shown in [Figure 2-2](#) is the only chassis control and is used to recover a disabled switch. The chassis LEDs provide information about the switch's operation status. These LEDs include the Over Temperature LED, Fan Fail LED, Heartbeat LED, and the Input Power LED. To apply power to the switch, plug the power cord into the switch AC power receptacle and into a 110 or 230 VAC power source.

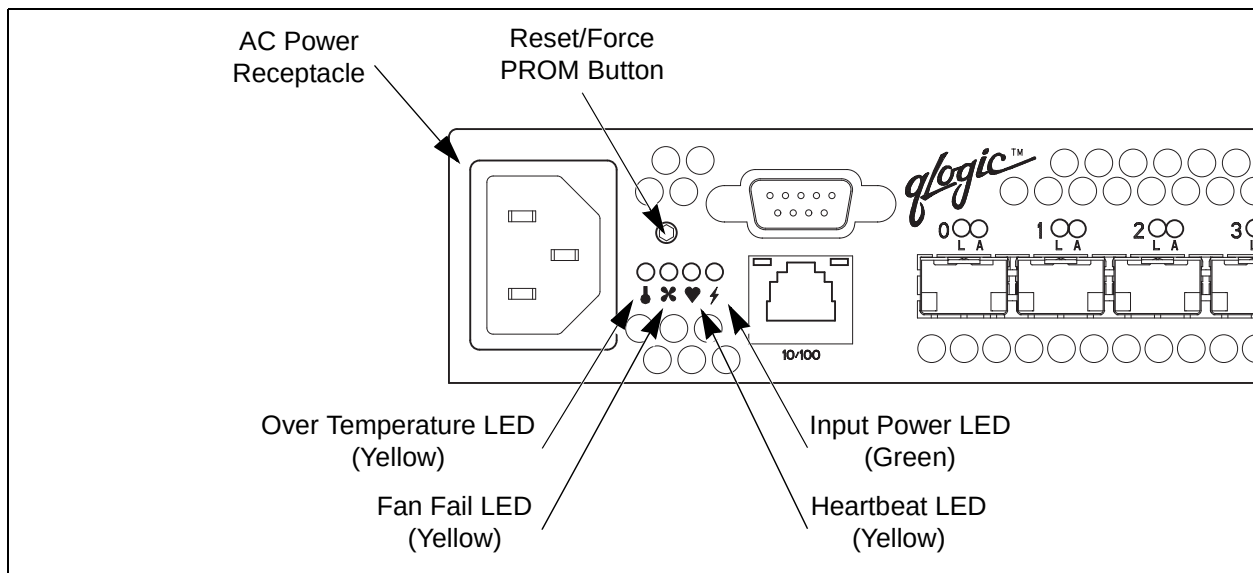


Figure 2-2. Chassis Controls and LEDs

2.1.1

Reset/Force PROM Button

The Reset/Force PROM button is a dual-function momentary switch on the front panel. Its purpose is to reset the switch or to place the switch in force PROM mode. Force PROM mode causes the switch to access PROM when flash memory or the resident configuration file is corrupted. Placing the switch in force PROM mode forces the default IP address of 10.0.0.1. To exit force PROM mode, reset the switch either by pressing the Reset/Force PROM button or power cycling the switch. Refer to ["Recovering a Switch" on page 5-6](#) for more information about using force PROM mode.

2.1.1.1

Resetting a Switch

To reset the switch, use a pointed tool to press and release (less than 4 seconds) the Reset/Force PROM button. The switch will respond as follows:

1. All of the chassis LEDs will illuminate and then extinguish leaving only the Input Power LED illuminated.
2. After approximately 1 minute, the power-on self test begins illuminating all chassis LEDs.
3. When the POST is complete, the chassis LEDs extinguish leaving the Input Power LED illuminated and the Heartbeat LED flashing once per second.

2.1.1.2

Placing the Switch in Force PROM Mode

To place the switch in force PROM mode, do the following:

1. Isolate the switch from the fabric.
2. Press and hold the Reset/Force PROM button with a pointed tool for about 4 seconds. When the Input Power LED alone is illuminated, release the button.
3. After approximately 1 minute, the power-on self test begins illuminating all chassis LEDs.
4. When the POST is complete, the chassis LEDs extinguish leaving the Input Power LED and the Heartbeat LED illuminated. The Heartbeat LED illuminates continuously while the switch is in force PROM mode.

To exit force PROM mode and return to normal operation, reset the switch.

2.1.2

Over Temperature LED (Yellow)

The Over Temperature LED provides status information about the air temperature inside the switch. This LED illuminates to indicate that the switch logic circuitry is overheating. Refer to [Section 5](#) for information about troubleshooting over temperature conditions.

2.1.3

Fan Fail LED (Yellow)

The Fan Fail LED indicates operational status of the fan. This LED illuminates if the speed of the fan falls below the normal range. If the Fan Fail LED illuminates, isolate the switch from the fabric, unplug the switch from the AC power source, and contact your authorized maintenance provider.

2.1.4

Heartbeat LED (Yellow)

The Heartbeat LED indicates the status of the internal switch processor and the results of the Power On Self Test (POST). Following a normal power-up, the Heartbeat LED blinks about once per second to indicate that the switch passed the POST and that the internal switch processor is running. In force PROM mode, the Heartbeat LED illuminates continuously. Refer to "[Heartbeat LED Blink Patterns](#)" on [page 5-1](#) for more information about Heartbeat LED blink patterns.

2.1.5

Input Power LED (Green)

The Input Power LED indicates the voltage status at the switch logic circuitry. This LED illuminates when the switch logic circuitry is receiving the proper DC voltages.

2.2

Fibre Channel Ports

Each SANbox2-8c switch has 8 Fibre Channel ports numbered 0–7 as shown in [Figure 2-3](#). Each of these ports is served by a Small Form-Factor Pluggable (SFP) optical transceiver. The ports self discover the proper mode when connected to public devices and other switches. You can also configure any port to support a loop of private devices.

Each port has its own Logged-In LED and Activity LED as shown in [Figure 2-3](#). The Logged-In LED indicates whether the port and its connected device are logged into the fabric. The Activity LED indicates the frequency at which frames are entering or leaving the port.

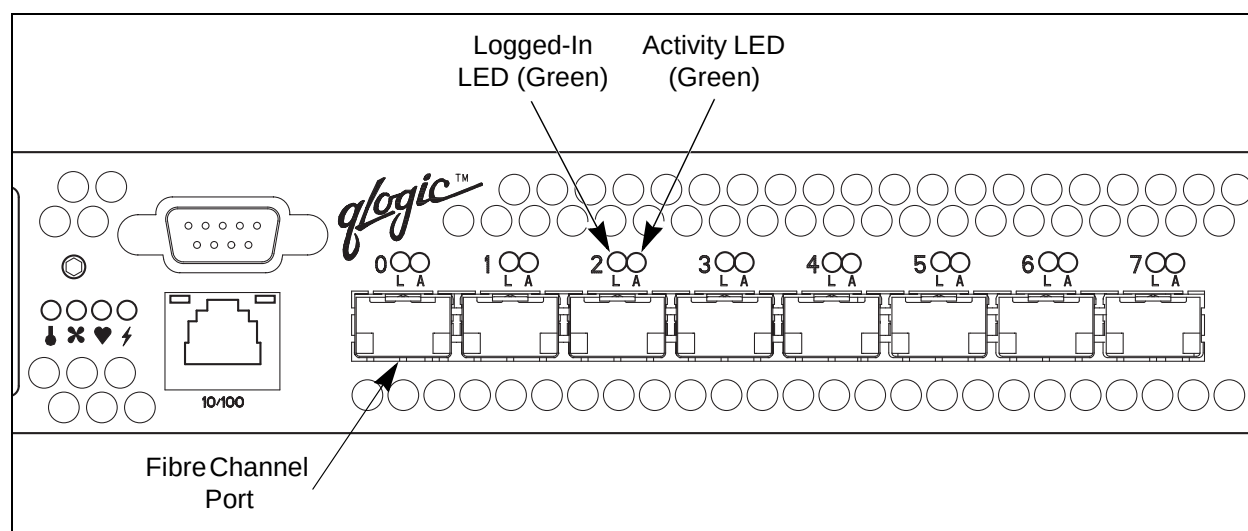


Figure 2-3. Fibre Channel Ports

2.2.1

Small Form-Factor Pluggable (SFP) Transceivers

SFP transceivers plug into the ports; duplex fiber optic cables plug into the transceivers which then connect to the devices. A port is capable of transmitting at 1 Gbps or 2 Gbps; however, the transceiver must be capable of 2 Gbps for the port to deliver at that rate.

The SFP transceivers are hot swappable. This means that you can remove or install an SFP transceiver while the switch is operating without harming the switch or the transceiver. However, communication with the connected device will be interrupted. Refer to ["Install SFP Transceivers" on page 4-4](#) for information about installing and removing SFP transceivers.

2.2.2

Port Modes

All ports are self-configuring generic ports: GL_Ports or G_Ports. A GL_Port self-discovers in the following ways:

- FL_Port when connected to a loop of public devices (NL_Port)
- F_Port when connected to a single public device (N_Port). If the device is a single device on a loop, the GL_Port will attempt to configure first as an F_Port, then if that fails, as an FL_Port.
- As an E_Port when connected to another FC-SW-2 compliant switch

A G_Port self-discovers as an F_Port when connected to a public device or an E_Port when connected to another switch. You can also configure a port as a translated loop port (TL_Port) to support private devices.

2.2.2.1

Fabric Ports

A fabric port supports either a single public device or a loop of up to 126 public devices. A fabric port configures itself during the fabric login process as an F_Port when connected to a single public device (N_Port), or an FL_Port when connected to a loop of public devices (NL_Port).

2.2.2.2

Expansion Port

E_Ports enable you to expand the fabric enabling you to connect SANbox2 switches with other FC-SW-2 compliant switches. SANbox2-8c switches self-discover all inter-switch connections. Refer to ["Multiple Chassis Fabrics" on page 3-2](#) for more information about multiple chassis fabrics.

2.2.2.3

Translated Loop Port

A TL_Port supports a loop of up to 126 private devices with the ability to communicate with “off-loop” devices such as public fabric devices and private devices on other TL_Ports. TL_Ports connect to devices that conform to the Fibre Channel-Private Loop SCSI Direct Attach (FC-PLDA) standard. Devices connected to TL_Ports are registered with the Name Server. Use SANbox Manager or the CLI to explicitly configure a TL_Port.

A TL_Port acts as a proxy for the off-loop device translating private frames into and from public frames. Each TL_Port can proxy up to 63 off-loop public or private devices that are maintained in its translation entries list.

- For a TL_Port connected to private target devices, the switch firmware automatically creates an entry in the translation entries list for each off-loop initiator device that attempts to establish communication. Soft zoning can be used to limit the number of potential initiators to 63.
- For a TL_Port connected to private initiator devices, the switch firmware automatically creates an entry in translation entries list for each target device that is a member of the same soft zone as the TL_Port devices. Before the TL initiator can communicate with other target devices on your fabric, you must create a WWN soft zone that includes both the initiator and targets. Initiator devices can not communicate with target devices outside the zone.

2.2.3

Logged-In LED

The Logged-in LED indicates the logged-in or initialization status of the connected devices. After successful completion of the POST, the switch extinguishes all Logged-In LEDs. Following a successful loop initialization or port log-in, the switch illuminates the corresponding logged-in LED. This shows that the port is properly connected and able to communicate with its attached devices. The Logged-In LED remains illuminated as long as the port is initialized or logged-in. An Logged-In LED will also illuminate when the port has been designated as a donor port and its buffer credits are being used by another port. Refer to ["Distance" on page 3-6](#) for more information about extended credits and donor ports.

If the port connection is broken or an error occurs that disables the port, the Logged-In LED will flash. Refer to ["Logged-In LED Indications" on page 5-3](#) for more information about the Logged-In LED.

2.2.4

Activity LED

The Activity LED indicates that data is passing through the port. Each frame that enters or leaves the port causes this LED to illuminate for 50 milliseconds. This makes it possible to observe the transmission of a single frame. When extending credits, an Activity LED for a donor port will reflect the traffic of the recipient port. Refer to ["Distance" on page 3-6](#) for more information about extended credits and donor ports.

2.3

Ethernet Port

The Ethernet port shown in [Figure 2-4](#) is an RJ-45 connector that provides a connection to a management workstation. A management workstation can be a Windows, Solaris, or Linux workstation that is used to configure and manage the switch fabric. The switch through which the fabric is managed is called the fabric management switch.

The Ethernet port has two LEDs: the Link Status LED (green) and the Activity LED (yellow). The Link Status LED illuminates continuously when an Ethernet connection has been established. The Activity LED illuminates when data is being transmitted or received over the Ethernet connection.

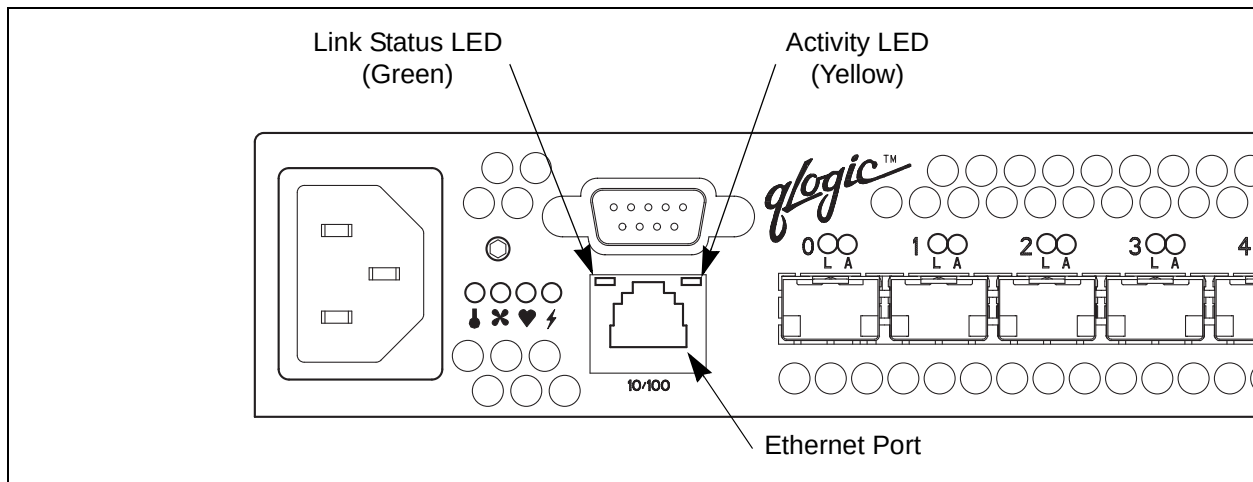


Figure 2-4. Ethernet Port

2.4 Serial Port

The SANbox2-8c switch is equipped with an RS-232 serial port for maintenance purposes as shown in [Figure 2-5](#). You can manage the switch through the serial port using the CLI.

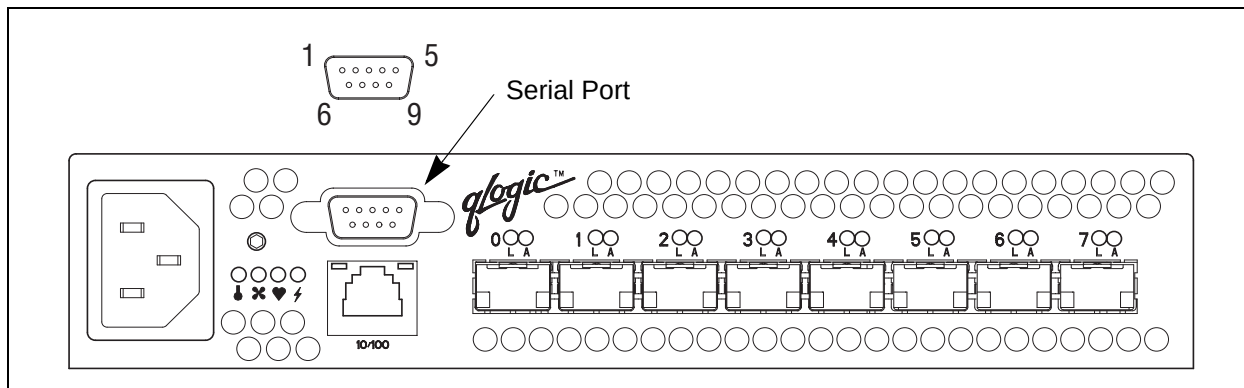


Figure 2-5. Serial Port and Pin Identification

The serial port connector requires a null-modem F/F DB9 cable. The pins on the switch RS-232 connector are shown in [Figure 2-5](#) and identified in [Table 2-1](#). Refer to "[Connect the Management Workstation to the Switch](#)" on [page 4-10](#) for information about connecting the management workstation through the serial port.

Table 2-1. Serial Port Pin Identification

Pin Number	Description
1	Carrier Detect (DCD)
2	Receive Data (RxD)
3	Transmit Data (TxD)
4	Data Terminal Ready (DTR)
5	Signal Ground (GND)
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)

2.5

Power Supply and Fan

The power supply converts standard 110 or 230 VAC to DC voltages for the various switch circuits. An internal fan provides cooling. Depending on the switch model, air flow is front-to-back or back-to-front. To energize the switch, plug the power cord into the switch AC receptacle and into a 110 or 230 VAC power source.

Note: The power supply and fan are not field replaceable units.

2.6

Switch Management

SANbox Manager is a PC-based Java® application that provides a graphical user interface for fabric management. This application runs on a Windows®, Solaris®, or Linux® workstation. The management workstation connects to the fabric directly through one switch's Ethernet port and provides in-band management for all other switches in the fabric. Refer to the *SANbox2 Switch Management User's Guide* for information about SANbox Manager and its use.

In addition to SANbox Manager, the switch also supports the following command line interface tools:

- Command Line Interface (CLI)
- File Transfer Protocol (FTP)
- Simple Network Management Protocol (SNMP)

The CLI provides monitoring and configuration functions by which the administrator can manage the fabric and its switches. Refer to [Appendix B Command Line Interface](#) for more information about the CLI commands.

FTP provides a command line interface for loading new firmware.

SNMP provides monitoring and trap functions for the fabric. SANbox2 firmware supports SNMP version 1, 2, and 3, the Fibre Alliance Management Information Base (FA-MIB) version 3.0, and the Fabric Element Management Information Base (FE-MIB) RFC 2837. Traps are formatted using SNMP version 2.

Notes

Section 3 Planning

Consider the following when planning a fabric:

- Devices
- Multiple chassis fabrics
- Performance
- Device access
- Fabric management
- Fabric security

3.1 Devices

When planning a fabric, consider the number of devices and the anticipated demand. This will determine the number of ports that are needed and in turn the number of switches. Consider how many and what types of switches are needed.

Consider the distribution of public and private devices as well as targets and initiators. Public devices have full Fibre Channel addressing capability, and therefore can communicate with any other public device on the fabric. A G_Port supports a single public device. A GL_Port can support up to 126 public devices in an arbitrated loop.

Private devices do not have full Fibre Channel addressing capability, only the Arbitrated Loop Physical Address (ALPA) portion. A TL_Port provides a proxy for a loop of private initiator or target devices allowing communication with off-loop public and private devices. Consider the number of private devices in the fabric and the number of off-loop devices with which the private devices must communicate. A TL_Port can support up to 126 private devices and can maintain communications with up to 63 off-loop devices.

The Fibre Channel ports use SFP optical transceivers, but the device host bus adapters you are using may not. Consider whether the device adapters use SFP transceivers or Gigabit Interface Converters (GBIC), and choose fiber optic cable accordingly. Use LC-type cable connectors for SFP transceivers and SC-type cable connectors for GBICs.

3.2

Multiple Chassis Fabrics

By connecting switches together you can expand the number of available ports for devices. Each switch in the fabric is identified by a unique domain ID, and the fabric will automatically resolve domain ID conflicts. Because the ports are self-configuring, you can connect SANbox2 and other FC-SW-2 compliant switches together in a wide variety of topologies.

3.2.1

Domain ID, Principal Priority, and Domain ID Lock

The following switch configuration settings affect multiple chassis fabrics:

- Domain ID
- Principal priority
- Domain ID lock

The domain ID is a unique number from 1–239 that identifies each switch in a fabric. The principal priority is a number (1–255) that determines the principal switch which manages domain ID assignments for the fabric. The switch with the highest principal priority (1 is high, 255 is low) becomes the principal switch. If the principal priority is the same for all switches in a fabric, the switch with the lowest WWN becomes the principal switch. The domain ID lock allows (FALSE) or prevents (TRUE) the reassignment of the domain ID on that switch. Switches come from the factory with the domain ID set to 1, the domain ID lock set to FALSE, and the principal priority set to 254. Refer to the *SANbox2 Switch Management User's Guide* for information about changing the domain ID using SANbox Manager. Refer to the ["Set Config Command" on page B-24](#) for information about changing the default domain ID domain ID lock, and principal priority settings.

If you connect a set of SANbox2 switches then power them up together, the principal switch will reassign any domain ID conflicts and establish the fabric. For any switch with a domain ID conflict and a domain ID lock set to TRUE, that switch will isolate as a separate fabric.

An unresolved domain ID conflict means that the switch with the higher WWN will isolate as a separate fabric, and the Logged-In LEDs on both switches will flash to show the affected ports. If you connect a new switch with its domain ID unlocked (domain ID lock = FALSE) to an existing fabric and a domain ID conflict occurs, the new switch will isolate as a separate fabric. However, you can remedy this by resetting the new switch or taking it offline then back online. The principal switch will reassign the domain ID and the switch will join the fabric.

Note: Domain ID reassignment is not reflected in zoning that is defined by domain ID/port number pair or Fibre Channel address. You must reconfigure zones that are affected by domain ID reassignment. To prevent zoning definitions from becoming invalid, use the Set Config Switch command to lock the domain IDs. Refer to the ["Set Config Command" on page B-24](#).

3.2.2

Common Topologies

This section describes three commonly used topologies:

- Cascade
- Mesh
- Multistage

3.2.2.1

Cascade Topology

A cascade topology describes a fabric in which the switches are connected in a line. If you connect the last switch back to the first switch, you create a cascade-with-a-loop topology as shown in [Figure 3-1](#). The loop reduces latency because any switch can route traffic in the shortest direction to any switch in the loop. The loop also provides failover should a switch fail.

The cascade fabric shown in [Figure 3-1](#) has the following characteristics:

- Each chassis link contributes up to 200 MB/s of bandwidth between chassis, 400 MB/s in full duplex. However, because of the sequential structure, that bandwidth will be shared by traffic between devices on other chassis.
- Latency between any two ports is no more than three chassis hops.
- 24 Fibre Channel ports are available for devices.

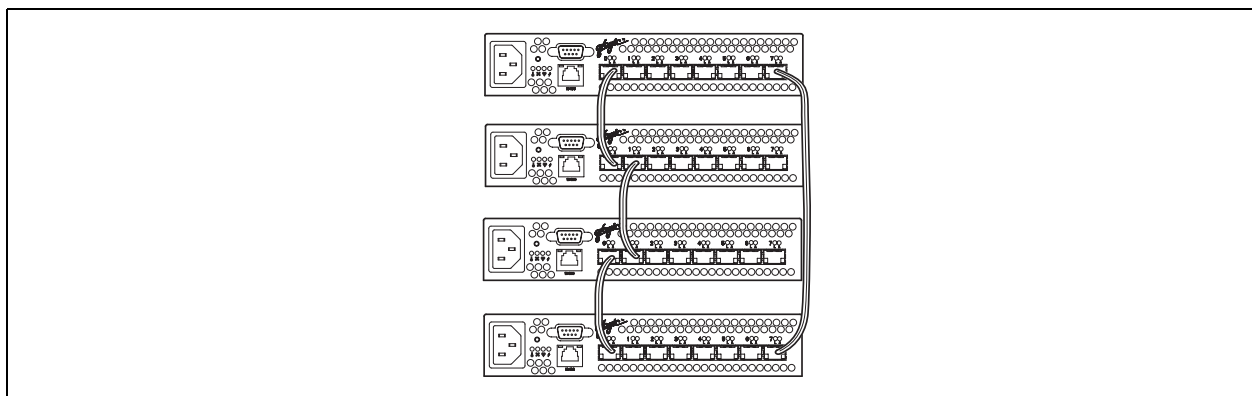


Figure 3-1. Cascade-with-a-Loop Topology

3.2.2.2

Mesh Topology

A mesh topology describes a fabric in which each chassis has at least one port directly connected to each other chassis in the fabric. The example mesh fabric shown in [Figure 3-2](#) has the following characteristics:

- Each link contributes up to 200 MB/s of bandwidth between switches, 400 MB/s in full duplex. Because of multiple parallel paths, there is less competition for this bandwidth than with a cascade or a multistage topology.
- Latency between any two device ports is no more than two chassis hops.
- 20 Fibre Channel ports are available for devices

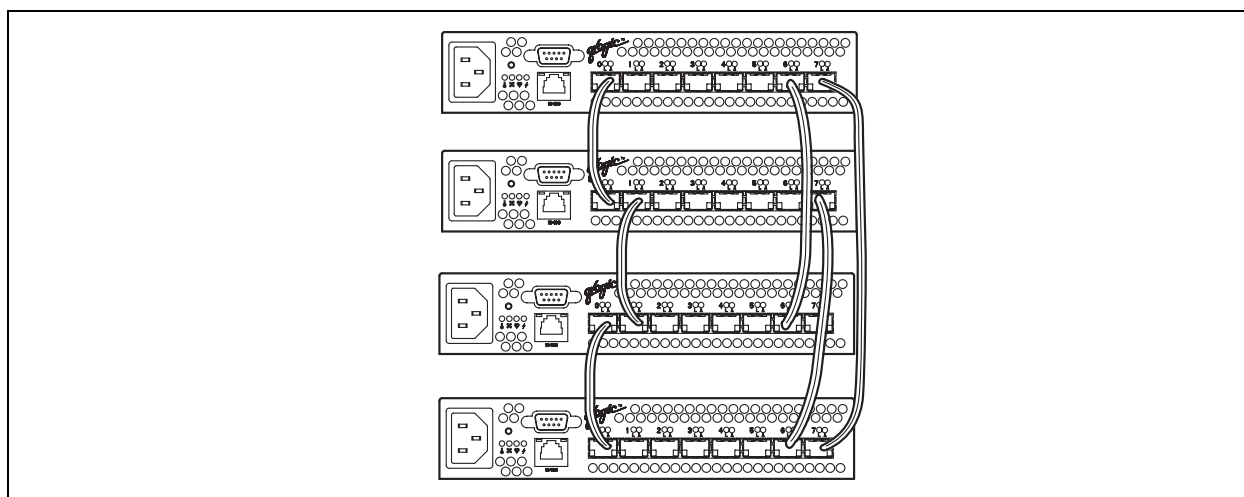


Figure 3-2. Mesh Topology

3.2.2.3

Multistage Topology

A multistage topology describes a fabric in which two or more edge switches connect to one or more core switches. Each additional core switch increases the bandwidth to each edge switch by 200 MB/s. The multistage fabric shown in [Figure 3-3](#) has the following characteristics:

- Each link contributes up to 200 MB/s of bandwidth between chassis. Competition for this bandwidth is less than that of a cascade topology, but greater than that of the mesh topology.
- Latency between any two device ports is three chassis hops.
- 26 Fibre Channel ports are available for devices

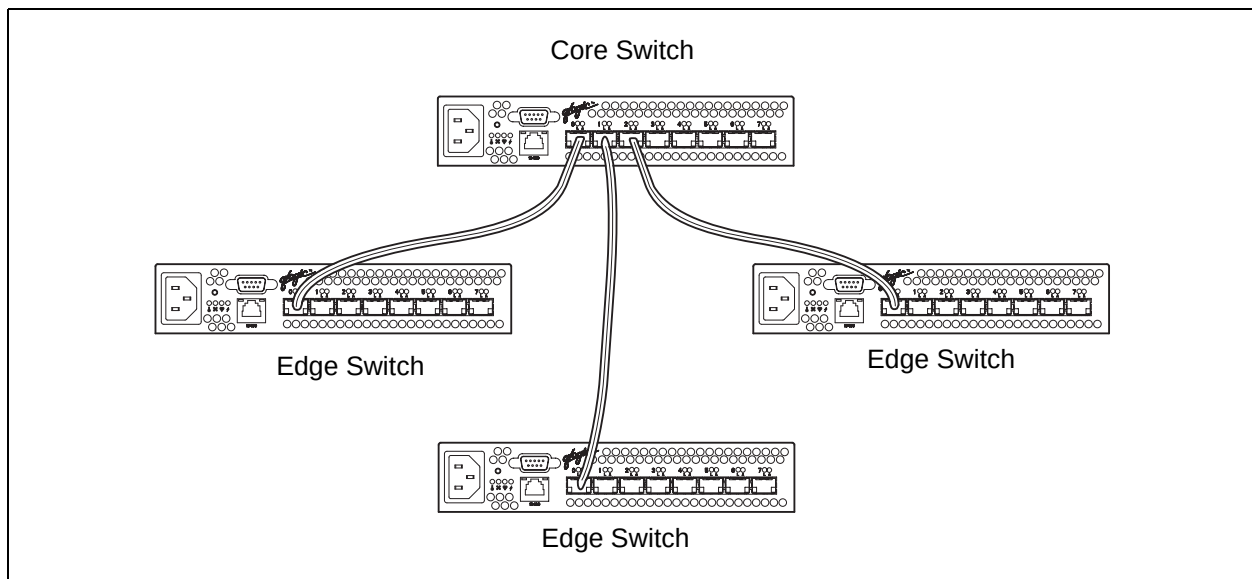


Figure 3-3. Multistage Topology

3.3 Performance

The SANbox2-8c switch supports class 2 and class 3 Fibre Channel service at transmission rates of 1 Gbps or 2 Gbps with a maximum frame size of 2148 bytes. A port can transmit or receive at 1 Gbps or 2 Gbps depending on the device to which it is connected. The port discovers the transmission speed prior to login when the connected device powers up. Related performance characteristics include the following:

- Distance
- Bandwidth
- Latency

3.3.1 Distance

Consider the physical distribution of devices and switches in the fabric. Choose SFP transceivers that are compatible with the cable type, distance, Fibre Channel revision level, and the device host bus adapter. Refer to [Appendix A Specifications](#) for more information about cable types and SFP transceivers.

Each port is supported by a data buffer with a 12 credit capacity; that is, 12 maximum sized frames. For fibre optic cables, this enables full bandwidth over a distance of 20 kilometers at 1 Gbps (0.6 credits/Km), or 10 kilometers at 2 Gbps (1.2 credits/Km). Beyond this distance, however, there is some loss of efficiency because the transmitting port must wait for an acknowledgement before sending the next frame.

Longer distances can be spanned at full bandwidth by extending credits on G_Ports and F_Ports. Each port can donate up to 11 credits to a pool from which a recipient port can borrow. For example, you can configure a recipient port to borrow up to 66 credits from 6 ports for a total of 78 credits. This will support communication over approximately 130 Km at 1 Gbps ($78 \div 0.6$) or 65 Km at 2 Gbps ($78 \div 1.2$).

You can configure recipient and donor ports using SANbox Manager or the Set Config command. Refer to the ["Set Config Command" on page B-24](#) for more information.

3.3.2

Bandwidth

Bandwidth is a measure of the volume of data that can be transmitted at a given transmission rate. A port can transmit or receive at 1 Gbps or 2 Gbps depending on the device to which it is connected. The switch supports all transmission rate combinations as shown in [Table 3-1](#).

Table 3-1. Port-to-Port Transmission Combinations

Source Port Rate	Destination Port Rate	Maximum Bandwidth
1 Gbps	1 Gbps	100 MB
1 Gbps	2 Gbps	100 MB
1 Gbps x 2 ports	2 Gbps	200 MB
2 Gbps	1 Gbps x 2 ports	100 MB each port ¹
2 Gbps	2 Gbps	200 MB

¹Bandwidth will be less for larger sequence sizes.

In multiple chassis fabrics, each link between chassis contributes 100 or 200 megabytes of bandwidth between those chassis. When additional bandwidth is needed between devices, increase the number of links between the connecting switches. The switch guarantees in-order-delivery with any number of links between chassis.

3.3.3

Latency

Latency is a measure of how fast a frame travels from one port to another. The factors that affect latency include transmission rate and the source/destination port relationship as shown in [Table 3-2](#).

Table 3-2. Port-to-Port Latency

Source/Destination Rates	Same Switch
1 Gbps - 1 Gbps	< 1 µsec
2 Gbps - 2 Gbps	< 0.5 µsec

3.4

Device Access

Consider device access needs within the fabric. Access is controlled by the use of zones and zone sets. Some zoning strategies include the following:

- Separate devices that use different operating systems.
- Separate devices that have no need to communicate with other devices in the fabric or have classified data.
- Separate devices into department, administrative, or other functional group.
- Group TL_Port devices with targets and initiators to allow automatic discovery.
- Reserve a path and its bandwidth from one port to another.

A zone is a named group of devices that can communicate with each other. Membership in a zone can be defined by switch port number, port Fibre Channel address, or by device World Wide Name (WWN). Devices can communicate only with devices that are members of the same zone. A zone can be a member of more than one zone set. Several zone sets can be defined for a fabric, but only one zone set can be active at one time. The active zone set determines the current fabric zoning.

A zoning database is maintained on each switch consisting of all inactive zone sets, the active zone set, all zones, aliases, and their membership. The SANbox2-8c switch supports the following maximum limits:

- 256 zone sets
- 256 zones
- 256 aliases
- 2000 alias and zone members combined

The following zone types define increasingly restrictive levels of communication:

- Soft zone
- Access Control List (ACL) - hard zone
- Virtual Private Fabric (VPF) - hard zone

3.4.1**Soft Zones**

Soft zoning divides the fabric for purposes of controlling discovery. Members of the same soft zone automatically discover and communicate freely with all other members of the same zone. The soft zone boundary is not secure; traffic across soft zones can occur if addressed correctly. Soft zones that include members from multiple switches need not include the ports of the inter-switch links. Soft zone boundaries yield to ACL and VPF zone boundaries. Soft zones can overlap; that is, a port can be a member of more than one soft zone. Membership can be defined by Fibre Channel address, port ID and domain ID, or worldwide name. Soft zoning supports all port modes.

3.4.2**Access Control List Hard Zones**

Access Control List (ACL) zoning divides the fabric for purposes of controlling discovery and inbound traffic. ACL zoning is a type of hard zoning that is hardware enforced. This type of zoning is useful for controlling access to certain devices without totally isolating them from the fabric. Members can communicate with each other and transmit outside the ACL zone, but cannot receive inbound traffic from outside the zone. The ACL zone boundary is secure against inbound traffic. ACL zones can overlap; that is, a port can be a member of more than one ACL zone. ACL zones that include members from multiple switches need not include the ports of the inter-switch links. ACL zone boundaries supersede soft zone boundaries, but yield to VPF zone boundaries. Membership can be defined only by port ID and domain ID. ACL zoning supports all port modes except TL_Ports.

3.4.3**Virtual Private Fabric Hard Zones**

Virtual Private Fabric (VPF) zoning divides the fabric for purposes of controlling discovery and both inbound and outbound traffic. This type of zoning is useful for providing security and reserving paths between devices to guarantee bandwidth. VPF zoning is a type of hard zoning that is hardware enforced. Members can only transmit to and receive from members of the same VPF zone. The VPF zone boundary is secure against both inbound and outbound traffic. VPF zones that include members from multiple switches must include the ports of the inter-switch links. VPF zones cannot overlap; that is, a port can be a member of only one VPF zone. VPF zone boundaries supersede both soft and ACL zone boundaries. Membership can be defined only by port ID and domain ID. VPF zoning supports all port modes.

3.5

Fabric Management

SANbox Manager and the CLI execute on a management workstation that provides for the configuration, control, maintenance of the fabric. Supported platforms include Windows, Solaris, and Linux. SANbox Manager can manage multiple fabrics. Consider how many fabrics will be managed, how many management workstations are needed, and whether the fabrics will be managed with the CLI or SANbox Manager.

The switch supports a combined maximum of 15 switch logins. This includes SANbox Manager inband or out-of-band logins, Telnet out-of-band logins, and SNMP out-of-band logins.

3.6

Fabric Security

You manage fabric security on a switch basis through the creation of user accounts. Each account consists of an account name, a password, and an authority level. There are two authority levels: User and Admin. These authority levels apply to SANbox Manager and to the CLI. User authority permits only monitoring and display tasks. Admin authority permits all management tasks including user administration. Consider your fabric security needs, who the system administrators will be, and authority levels they should have.

- Refer to ["Commands" on page B-3](#) for more information about authority levels.
- Refer to the ["User Command" on page B-59](#) for information about creating user accounts.
- Refer to the ["Set Setup Command" on page B-34](#) and the System keyword for information about fabric security and the enforcement of user accounts.

Section 4 Installation

This section describes how to install and configure the SANbox2-8c switch. It also describes how to load new firmware and how to recover a disabled switch.

4.1

Site Requirements

The following items are required for the installation of a SANbox2-8c switch:

- Fabric management workstation
- Power requirements
- Environmental conditions

4.1.1

Fabric Management Workstation

SANbox Manager requires a management workstation equipped as described in [Table 4-1](#):

Table 4-1. Management Workstation Requirements

Operating System	■ Windows® NT, 2000, 95/98 ■ Linux® 6.2 Red Hat® ■ Solaris®
Memory	128 MB or more
Disk Space	150 MB per installation
Processor	300 MHz or faster
Hardware	CD-ROM drive, RS-232 serial port, RJ-45 Ethernet port
Internet Browser	Microsoft Internet Explorer® Netscape Navigator®

Telnet workstations require an RJ-45 Ethernet port and an operating system with a Telnet client.

4.1.2

Switch Power Requirements

Operating voltage requirements are as follows:

90 to 137 Vac; 47 to 63 Hz
180 to 264 Vac; 47 to 63 Hz

4.1.3

Environmental Conditions

Consider the factors that affect the climate conditions in your facility such as heat dissipation and ventilation. The switch requires the following operating conditions:

- Operating temperature range: 5 to 50°C (41 to 122°F)
- Relative humidity: 15% to 80%, non-condensing

4.2

Installing a Switch

Unpack the switch and accessories. The SANbox2-8c product is shipped with the components shown in [Figure 4-1](#):

- SANbox2-8c Fibre Channel Switch (1) with firmware installed
- Power cord (1)
- Rubber feet (4)
- CD-ROM containing the SANbox Manager switch management application, release notes, and documentation

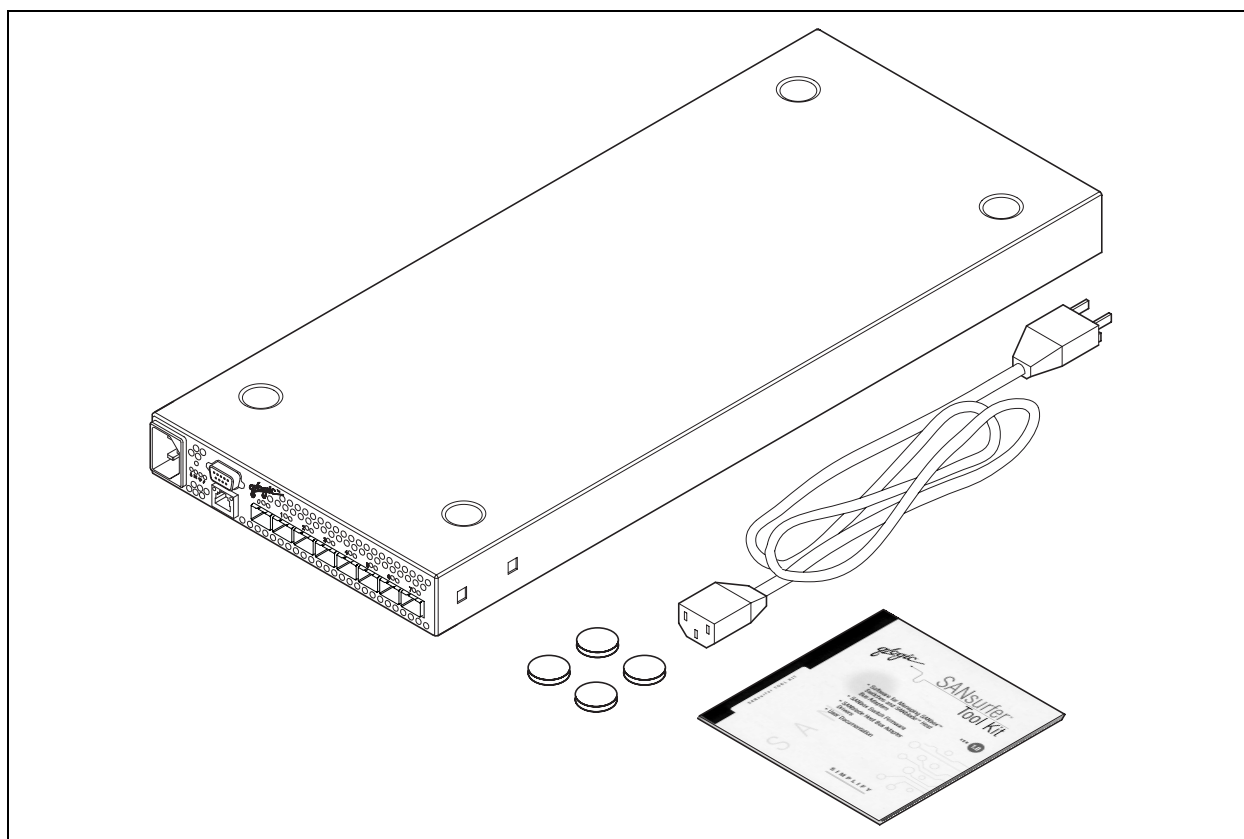


Figure 4-1. SANbox2-8c Fibre Channel Switch

Installing a SANbox2-8c switch involves the following steps:

1. Mount the switch
2. Install SFP transceivers
3. Connect the switch to the AC power source
4. Install SANbox Manager
5. Connect the management workstation to the switch
6. Set the date
7. Configure the switch
8. Configure the ports
9. Cable devices to the switch

4.2.1

Mount the Switch

The switch can be placed on a flat surface and stacked or mounted in a 19" EIA rack. The top of each chassis has dimples to receive the rubber feet of a second chassis stacked on top. Without the rubber feet, the switch occupies 1U of space in an EIA rack. A rail kit is required for rack mounting and is available through QLogic Corporation.

WARNING!! Mount switches in the rack so that the weight is distributed evenly. An unevenly loaded rack can become unstable possibly resulting in equipment damage or personal injury.

CAUTION! If the switch is mounted in a closed or multi-unit rack assembly, make sure that the operating temperature inside the rack enclosure does not exceed the maximum rated ambient temperature. Refer to ["Switch Environmental" on page A-3](#). Do not restrict chassis air flow. Allow 16 cm (6.5 in) minimum clearance at the front and rear of the rack for service access and ventilation.

Multiple rack-mounted units connected to the AC supply circuit may overload that circuit or overload the AC supply wiring. Consider the power source capacity and the total power usage of all switches on the circuit. Refer to ["Switch Electrical" on page A-3](#).

Reliable grounding in the rack must be maintained from the switch chassis to the AC power source.

4.2.2

Install SFP Transceivers

The switch has been validated with transceivers that support a variety of interconnection media. To install, insert the transceiver into the port and gently press until it snaps in place as shown in [Figure 4-2](#). To remove a transceiver, gently press the transceiver into the port to release the tension, then pull on the release tab or lever and remove the transceiver. Different transceiver manufacturers have different release mechanisms. Consult the documentation for your transceiver.

Note: The SFP transceiver will fit only one way. If the SFP does not install under gentle pressure, flip it over and try again.

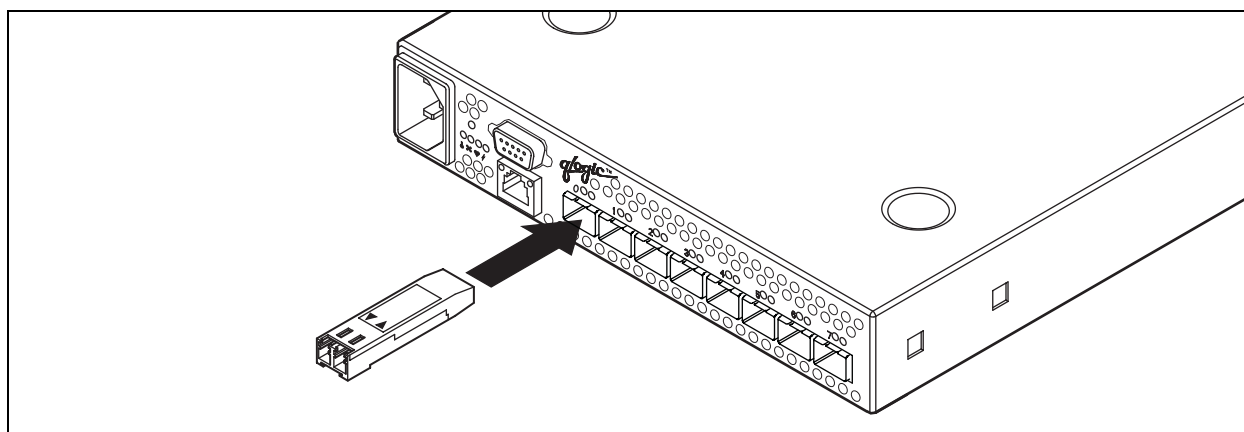


Figure 4-2. SFP Transceiver Installation

4.2.3

Connect the Switch to AC Power

WARNING!! This product is supplied with a 3-wire power cord and plug for the user's safety. Use this power cord in conjunction with a properly grounded outlet to avoid electrical shock. An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the Switch chassis. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent electrical shock.

You may require a different power cord in some countries because the plug on the cable supplied with the equipment will not fit your electrical outlet. In this case, you must supply your own power cord. The cable you use must meet the following requirements:

For 125 Volt electrical service, the cable must be rated at 10 Amps and be approved by UL and CSA.

For 250 Volt electrical service: The cable must be rated at 10 Amps, meet the requirements of H05VV-F, and be approved by VDE, SEMKO, and DEMKO.

AVERTISSEMENT!!

Pour la sécurité de l'utilisateur, l'appareil est livré avec un câble d'alimentation trifilaire et une fiche. Pour éviter toute secousse électrique, enficher ce câble à une prise correctement mise à la terre. Une prise électrique dont les fils sont mal branchés peut créer une tension dangereuse dans les pièces métalliques du châssis Switch. Pour éviter toute secousse électrique, s'assurer que les fils sont correctement branchés et que la prise est bien mise à la terre.

Dans certains pays les prises électriques sont de modèle différent; on ne peut y enficher le câble de l'appareil. On doit donc en utiliser un autre ayant les caractéristiques suivantes:

Alimentation 125 V: Câble pour courant nominal de 10 A, agréé LAC et CSA.

Alimentation 250 V: Câble pour courant nominal de 10 A, conforme au H05VV-F, et agréé VDE, SEMKO et DEMKO.

WARNUNG!!

Dieses Produkt wird mit einem 3-adrigen Netzkabel mit Stecker geliefert. Dieses Kabel erfüllt die Sicherheitsanforderungen und sollte an einer vorschriftsmäßigen Schukosteckdose angeschlossen werden, um die Gefahr eines elektrischen Schlages zu vermeiden. Elektrosteckdosen, die nicht richtig verdrahtet sind, können gefährliche Hochspannung an den Metallteilen des Switch-Gehäuses verursachen. Der Kunde trägt die Verantwortung für eine vorschriftsmäßige Verdrahtung und Erdung der Steckdose zur Vermeidung eines elektrischen Schlages.

In manchen Ländern ist eventuell die Verwendung eines anderen Kabels erforderlich, da der Stecker des mitgelieferten Kabels nicht in die landesüblichen Steckdosen paßt. In diesem Fall müssen Sie sich ein Kabel besorgen, daß die folgenden Anforderungen erfüllt:

Für 125 Volt-Netze: 10 Ampere Kabel mit UL- und CSA-Zulassung.

Für 250 Volt-Netze: 10 Ampere Kabel gemäß den Anforderungen der H05VV-F und VDE-, SEMKO- und DEMKO-Zulassung.

To energize the switch, connect the power cord to the AC power receptacle on the front of the switch chassis and to a grounded AC outlet. The switch responds in the following sequence:

1. The chassis LEDs (Fan Fail, Over Temperature, Heartbeat, Input Power) illuminate followed by all port Logged-In LEDs.
2. After a couple seconds, the Over Temperature, Fan Fail, and Heartbeat LEDs are extinguished while the Input Power LED remains illuminated.
3. After approximately one minute, the POST executes and all LEDs illuminate.
4. When the POST is complete, all LEDs are extinguished except the Input Power LED and the Heartbeat LED:
 - The Input Power LED remains illuminated indicating that the switch logic circuitry is receiving DC voltage. If not, contact your authorized maintenance provider.
 - The Heartbeat LED indicates the results of the POST. The POST tests the condition of firmware, memories, data-paths, and switch logic circuitry. If the Heartbeat LED blinks steadily about once per second, the POST was successful, and you can continue with the installation process. Any other blink pattern indicates that an error has occurred. Refer to ["Heartbeat LED Blink Patterns" on page 5-1](#) for more information about error blink patterns.

4.2.4

Install SANbox Manager

You can install SANbox Manager on the Windows, Linux, and Solaris platforms. Refer to the subsection that corresponds to your workstation:

- [4.2.4.1 SANbox Manager Installation for Windows](#)
- [4.2.4.2 SANbox Manager Installation for Linux](#)
- [4.2.4.3 SANbox Manager Installation for Solaris](#)

4.2.4.1

SANbox Manager Installation for Windows

To install the SANbox Manager application on Windows from the SANSurfer® Tool Kit CD-ROM, do the following:

1. Close all programs currently running, and insert the SANSurfer Tool Kit CD into the management workstation CD-ROM drive. If the SANSurfer Tool Kit start page does not open in your default browser, do the following:
 - a. Using Windows Explorer, double-click the drive letter which contains the SANSurfer Tool Kit CD.
 - b. Locate and double-click the **Start_Here.htm** file to open the SANSurfer® Tool Kit start page in your default browser.
2. On the SANSurfer Tool Kit start page, choose the **SANbox Switch Software** button.
3. On the SANbox Switch Software page, scroll to the SANbox2-8c (2Gb) Series area.
4. In the Windows column, choose the **SANbox Manager** link to open the File Download window.
5. You have a choice of running the installation file from the CD-ROM or downloading the installation file to your hard drive. Choose one of the following:
 - Open the installation file from the CD-ROM and follow the SANbox Manager installation instructions.
 - Specify a location in which to save the **sansurfer_windows_install.exe** file, and choose the **Save** button. Double-click the saved **sansurfer_windows_install.exe** file and follow the SANbox Manager installation instructions.

4.2.4.2

SANbox Manager Installation for Linux

To install the SANbox Manager application on Linux from the SANsurfer Tool Kit CD-ROM, do the following:

1. Close all programs currently running, and insert the SANsurfer Tool Kit CD into the management workstation CD-ROM drive. If a file browser window opens showing icons for the contents of the CD-ROM, double-click the **Start_Here.htm** file to open the SANsurfer Tool Kit start page. If a file browser does not open, double-click the CD-ROM icon on the to open the browser. If there is no CD-ROM icon on the, do the following:
 - a. Open an xterm or other terminal window.
 - b. Mount the CD-ROM. From a shell prompt, enter the following command:

```
mount /mnt/cdrom
```
 - c. Execute your web browser to view the **Start_Here.htm** document using one of the following commands:

```
$mozilla file:/mnt/cdrom/Start_Here.htm
```


or

```
$netscape file:/mnt/cdrom/Start_Here.htm
```
 - d. The SANsurfer Tool Kit start page opens in your default browser.
2. On the SANsurfer Tool Kit start page, choose the **SANbox Switch Software** button.
3. On the SANbox Switch Software page, scroll to the SANbox2-8c (2Gb) Series area.
4. In the Linux column, choose the **SANbox Manager** link to open the Save As window.
5. Enter a path name to save the **sansurfer_linux_install.bin** file, and choose the **Save** button.
6. Open a terminal window for the directory in which the **sansurfer_linux_install.bin** file was saved, and enter the following command:

```
chmod +x sansurfer_linux_install.bin
```
7. Press the **Enter** key.
8. Enter the following command:

```
./sansurfer_linux_install.bin
```
9. Press the **Enter** key, and follow the SANbox Manager installation instructions.

4.2.4.3

SANbox Manager Installation for Solaris

To install the SANbox Manager application on Solaris from the SANSurfer Tool Kit CD-ROM, do the following:

1. Close all programs currently running, and insert the SANSurfer Tool Kit CD into the management workstation CD-ROM drive. If the SANSurfer Tool Kit start page does not open in your default browser, do the following:
 - a. Right-click the to open the Workspace Menu.
 - b. Point to and select **Files**, then select **File Manager**.
 - c. In File Manager, double-click the CD-ROM icon, and then double-click the Sansurfer folder.
 - d. In the Sansurfer folder, double-click the **Start_Here.htm** file to open the SANSurfer Tool Kit start page in your default browser.
2. On the SANSurfer Tool Kit start page, choose the **SANbox Switch Software** button.
3. On the SANbox Switch Software page, scroll to the SANbox2-8c (2Gb) Series area.
4. In the Solaris column, choose the **SANbox Manager** link to open the Save As window.
5. Enter a path name to save the **sansurfer_solaris_install.bin** file and choose the **Save** button.
6. Open a terminal window for the directory in which the **sansurfer_solaris_install.bin** file was saved, and enter the following command:


```
chmod +x sansurfer_solaris_install.bin
```
7. Press the **Enter** key.
8. Enter the following command:


```
./sansurfer_solaris_install.bin
```
9. Press the **Enter** key, and follow the SANbox Manager installation instructions

Note: If you download SANbox Manager from a server, be sure the downloaded file has execute permission before installing.

4.2.5

Connect the Management Workstation to the Switch

Connect the management workstation to the switch in one of three ways:

- Indirect Ethernet connection from the management workstation to the switch RJ-45 Ethernet connector through an Ethernet switch or a hub. This requires a 10/100 Base-T straight cable as shown in [Figure 4-3](#). With this method, you can manage the switch with SANbox Manager or the CLI.
- Direct Ethernet connection from the management workstation to the switch RJ-45 Ethernet connector. This requires a 10/100 Base-T cross-over cable as shown in [Figure 4-3](#). With this method provides, you can manage the switch with SANbox Manager or the CLI.
- Serial port connection from the management workstation to the switch RS-232 serial port connector. This requires a null modem F/F DB9 cable as shown in [Figure 4-3](#). With this method, you can manage the switch with the CLI.

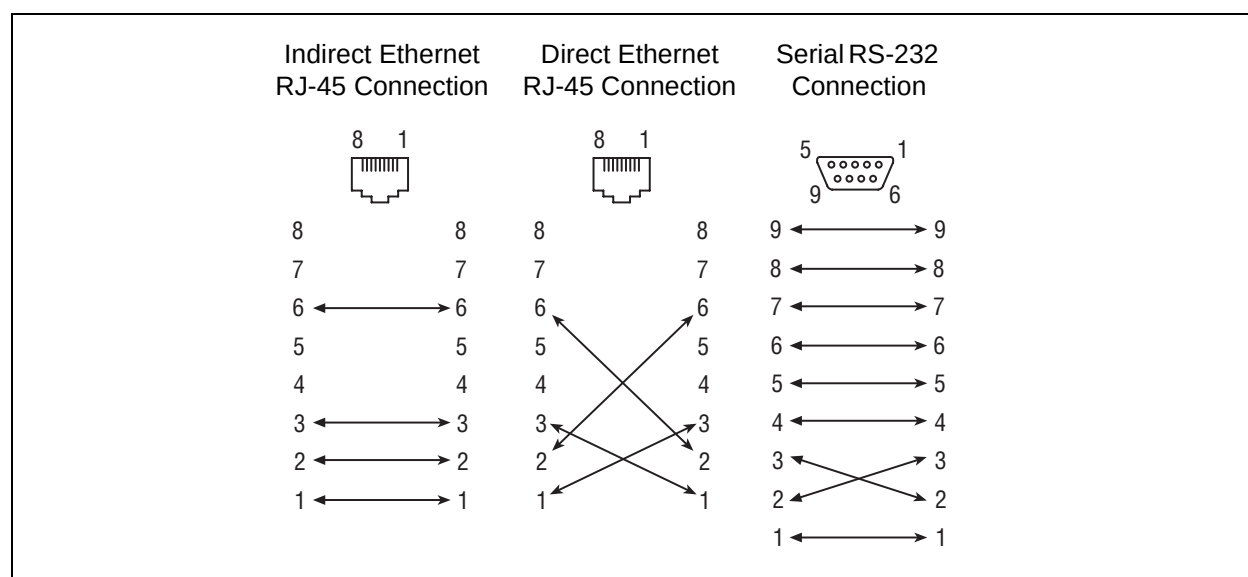


Figure 4-3. Ethernet and Serial Cable Connections

4.2.5.1

Ethernet Connection

To establish an Ethernet connection, do the following:

1. Connect a 10/100 Base-T cross-over cable from a COM port on the management workstation directly to the RJ-45 Ethernet port; or a 10/100 Base-T straight cable indirectly over an Ethernet network.
2. Open a command line window.
3. Open a Telnet session by entering the following command with the switch IP address. The default IP address is 10.0.0.1

```
telnet 10.0.0.1
```

4. Log in to the switch. If fabric security is disabled, account names and passwords are not enforced. Refer to the ["Set Setup Command" on page B-34](#) for information about setting fabric security. The default account name and password are (admin, password).

```
SANbox2 Login: admin
```

```
Password: *****
```

4.2.5.2

Serial Connection

To establish a serial port connection, do the following:

1. Connect a null modem F/F DB9 cable from a COM port on the management workstation to the RS-232 serial port on the switch.
2. Configure the connection according to your platform:

■ For Windows:

- a. Open the HyperTerminal application on a Windows platform. Choose the **Start** button, select **Programs, Accessories, HyperTerminal, and HyperTerminal**.
- b. Enter a name for the switch connection and choose an icon in the Connection Description window. Choose the **OK** button.
- c. Select the COM port in the Connect To window and choose the **OK** button.
- d. Enter the following COM Port settings in the COM Properties window and choose the **OK** button.
 - ☐ Bits per second: 9600
 - ☐ Data Bits: 8
 - ☐ Parity: None
 - ☐ Stop Bits: 1
 - ☐ Flow Control: None

- For Linux:
 - a. Set up minicom to use the serial port. Create or modify the /etc/minirc.dfl file with the following content:

```
pr portdev/ttyS0
pu minit
pu mreset
pu mhangup
```
 - b. Verify that all users have permission to run minicom. Review the /etc/minicom/users file and confirm that the line "ALL" exists or that there are specific user entries.
 - c. Enter the following command at the Linux prompt:

```
minicom
```
- For Solaris:
 - a. Set up Solaris to use the serial port. Modify the /etc/remote file to include the following lines:

```
sanbox2:\
:dv=/dev/term/a:br#9600:el=C^S^Q^U^D:ie%$:oe=^D:
```
 - b. Enter the following command at the Solaris prompt:

```
# tip sanbox2
```
- 3. Log in to the switch. If fabric security is disabled, account names and passwords are not enforced. Refer to the ["Set Setup Command" on page B-34](#) for information about setting fabric security. The default account name and password are (admin, password).

```
SANbox2 Login: admin
Password: *****
```

4.2.6

Set the Date

To set the date and time on the switch, do the following:

Note: The SANbox2-8c switch can maintain the date in memory for only a few hours after being shut down.

1. Using an Ethernet or a serial connection, open an admin session by entering the following command:

```
SANbox2 $> admin start
```

2. Enter the Date command and parameters (MMDDhhmmCCYY format) to set the system date on the switch.

```
SANbox2 (admin) $> date 083007512002
```

<an alarm is displayed that specifies that the switch must be reset before the date can be set>
3. To reset the switch, enter the following command and press the Enter key.

```
SANbox2 (admin) $> reset switch
```

4.2.7

Configure the Switch

Do the following to configure a switch using the SANbox Manager application. Refer to the *SANbox2 Switch Management User's Guide* for more information about configuring a switch. You can also configure the switch using the CLI. Refer to [Appendix B](#) for information about the Command Line Interface.

1. Connect to the switch using an Ethernet connection and run SANbox Manager.
2. Open the Fabric menu and select **Add Fabric** to open the Add a New Fabric window.
3. Enter a fabric name and the IP address of the switch through which to manage the fabric.
4. Enter an account name and a password and choose the **Add Fabric** button. The default account name and password are (admin, password). If fabric security is disabled, account names and passwords are not enforced. Refer to the ["Set Setup Command" on page B-34](#) for information about setting fabric security.
5. Open the Switch menu and select **Switch Properties**. In the Switch Properties window, enter a chassis name. Accept the default domain ID, and choose the **OK** button.
6. Open the Switch menu and select **Network Properties**. In the Network Properties window, enter values for the IP address, subnet mask, and gateway address. Accept the default static setting. If you know the SNMP configuration settings, enter those as well. Choose the **OK** button.
7. Remove the old fabric and add a new one. Add a fabric with the new IP address.

Repeat this process for each switch in the fabric, then connect the switches.

4.2.8

Configure the Ports

Configuring a port involves defining the port mode and setting the frame sequencing if necessary. For public devices and other switches, a switch automatically sets the port mode as each port discovers the type of device to which it is connected.

A GL_Port will self configure as an FL_Port when connected to a loop of public devices or an F_Port when connected to a single device. A G_Port will self configure as an F_Port when connected to a single public device. Both GL_Ports and G_Ports self configure as E_Ports when connected to another switch. Refer to the *SANbox2 Switch Management User's Guide* for more information about configuring ports. You can also configure ports using the CLI. Refer to [Appendix B](#) for information about the CLI.

4.2.9

Cable Devices to the Switch

Connect cables to the SFP transceivers and their corresponding devices, and then energize the devices. Device host bus adapters can have SFP (or SFF) transceivers or GigaBit Interface Converters (GBIC). LC-type duplex fiber optic cable connectors are designed for SFP transceivers, while SC-type connectors are designed for GBICs. Duplex cable connectors are keyed to ensure proper orientation. Choose the fiber optic cable with the connector combination that matches the device host bus adapter.

4.3

Loading Firmware

The switch comes with current firmware installed. However, you can upgrade switch firmware from a Windows, Solaris, or Linux workstation. New firmware can be loaded on the switch while the switch is operating without disrupting service. However, you must reset the switch to activate the new firmware, which does disrupt service.

4.3.1

Using File Transfer Protocol to Load Firmware

To load and activate new firmware, do the following:

1. Connect a workstation to the switch through the Ethernet port.
2. Move to the folder or directory that contains the new firmware image file.

3. Establish communications with the switch using the File Transfer Protocol (FTP). Enter one of the following on the command line:
`>ftp xxx.xxx.xxx.xxx`
 or
`>ftp switchname`
 where `xxx.xxx.xxx.xxx` is the switch IP address and `switchname` is the switch name associated with the IP address.
4. Enter the following account name and password:
`user:images`
`password:images`
5. Activate binary mode and copy the firmware image file (filename.img) on the switch:
`ftp>bin`
`ftp>put filename`
6. Close the FTP session.
`ftp>quit`
7. Establish communications with the switch using Telnet. Enter one of the following on the command line:
`telnet xxx.xxx.xxx.xxx`
 or
`telnet switchname`
 where `xxx.xxx.xxx.xxx` is the switch IP address and `switchname` is the switch name associated with the IP address.
8. Open an Admin session to acquire the necessary authority.
`SANbox2 $>admin start`
9. Display the list of firmware image files on the switch to confirm that the file was loaded. Refer to the ["Image Command" on page B-13](#).
`SANbox2 (admin) $>image list`
10. Unpack the firmware image file to install the new firmware in flash memory.
`SANbox2 (admin) $>image unpack filename`
11. Reset the switch to activate the new firmware. This will close the Telnet session by default.
`SANbox2 (admin) $>reset`

4.3.2

Using SANbox Manager to Load Firmware

To load the firmware using SANbox Manager, do the following:

1. From the Faceplate display, open the Switch menu and select **Load Firmware**.
2. In the Firmware Upload window, browse and select the firmware file you want to load.
3. In the Firmware Upload window, choose the **Start** button to begin the loading process. When the firmware is finished loading, the Bytes Transferred field displays the number of bytes transferred during the loading process.
4. Choose the **Close** button to close the Firmware Upload window.
5. Open the Switch menu and select **Reset Switch** to activate the new firmware.

4.3.3

Using the CLI to Load Firmware

To load the firmware using the CLI, do the following:

1. Enter the following account name and password:

```
SANbox2 Login:admin  
Password: password
```
2. To start an Admin session, enter the following:

```
SANbox2 $> admin start
```
3. Retrieve the firmware file. The device on which the firmware file is stored must be running an FTP server. Enter the following command to retrieve the firmware file from the specified IP address:

```
SANbox2 (admin) #> image fetch username 10.0.0.254  
firmwarefilenameetoload firmwarefilenameonswitch  
Connected to 10.0.0.254.
```

Note: If prompted for your password, enter your password (for that IP Address) and press the Enter key.

```
331 Password required for username.  
Password:  
230 User username logged in.  
bin  
200 Type set to I.  
verbose  
Verbose mode off.
```

4. Enter the following command to display the list of firmware files:
SANbox2 (admin) #> image list *firmwarefilenameonswitch*
5. Enter the following command to install the new firmware:
SANbox2 (admin) #>image unpack *firmwarefilenameonswitch*
6. Reset the switch to activate the new firmware.
SANbox2 (admin) \$>reset

Notes

Section 5

Diagnostics/Troubleshooting

Diagnostic information about the switch is available through the chassis LEDs and the port LEDs. Diagnostic information is also available through the SANbox Manager and CLI event logs and error displays. This section describes two types of diagnostics: Power On Self Test (POST) and chassis. POST diagnostics describe the Heartbeat LED and the port Logged-In LED indications. Chassis diagnostics cover power supply and fan diagnostics as well as chassis over temperature conditions. This section also describes how to use force PROM mode to recover a disabled switch.

5.1

POST Diagnostics

The switch performs a series of Power On Self Tests (POST) as part of its power-up procedure. The POST diagnostic program performs the following tests:

- Checksum tests on the boot firmware in PROM and the switch firmware in flash memory
- Internal data loopback test on all ports
- Access and integrity test on the ASIC

During the POST, the switch logs any errors encountered. Some POST errors are fatal, others are non-fatal. The switch uses the Heartbeat LED and the Logged-In LED to indicate switch and port status. A fatal error disables the switch so that it will not operate. A non-fatal error allows the switch to operate, but disables the ports that have errors. Whether the problem is fatal or non-fatal, contact your authorized maintenance provider.

If there are no errors, the Heartbeat LED blinks at a steady rate of once per second. If a fatal error occurs, the Heartbeat LED will show an error blink pattern. If there are non-fatal errors, the switch disables the failed ports and flashes the corresponding Logged-In LEDs. Refer to ["Heartbeat LED Blink Patterns" on page 5-1](#) for more information about Heartbeat LED blink patterns.

5.1.1

Heartbeat LED Blink Patterns

5.1.1.1

Normal (all pass)

If all POST diagnostics pass, the switch will go to normal operation and the Heartbeat LED will blink at a steady rate of one (1) blink per second.

5.1.1.2

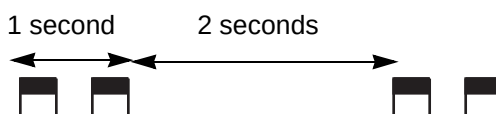
Force PROM Mode Pattern

Steady illumination indicates that the switch is in force PROM mode, which returns the switch IP address to 10.0.0.1. From force PROM mode, you may reload firmware, reset the password to the factory default, and remove a corrupt configuration.

5.1.1.3

Internal Firmware Failure Blink Pattern

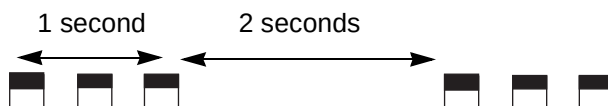
An internal firmware failure blink pattern is 2 blinks per second followed by a two second pause. The 2-blink error pattern indicates that the firmware has failed, and that the switch must be reset.



5.1.1.4

Fatal Error Blink Pattern

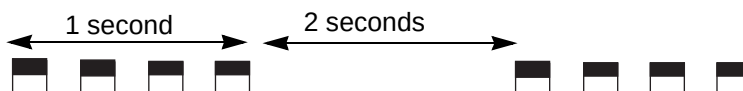
A fatal error blink pattern is 3 blinks per second followed by a two second pause. The 3-blink error pattern indicates that a fatal error has left the switch inoperable. If a fatal error occurs, contact your authorized maintenance provider.



5.1.1.5

Configuration File System Error Blink Pattern

A configuration file system error blink pattern is 4 blinks per second followed by a two second pause. The 4-blink error pattern indicates that a configuration file system error has occurred, and that a Remake File System procedure is necessary to return the switch to a normal state. Refer to ["Recovering a Switch" on page 5-6](#) for more information.



5.1.2

Logged-In LED Indications

Port diagnostics are indicated by the Logged-In LED for each port as shown in [Figure 5-1](#).

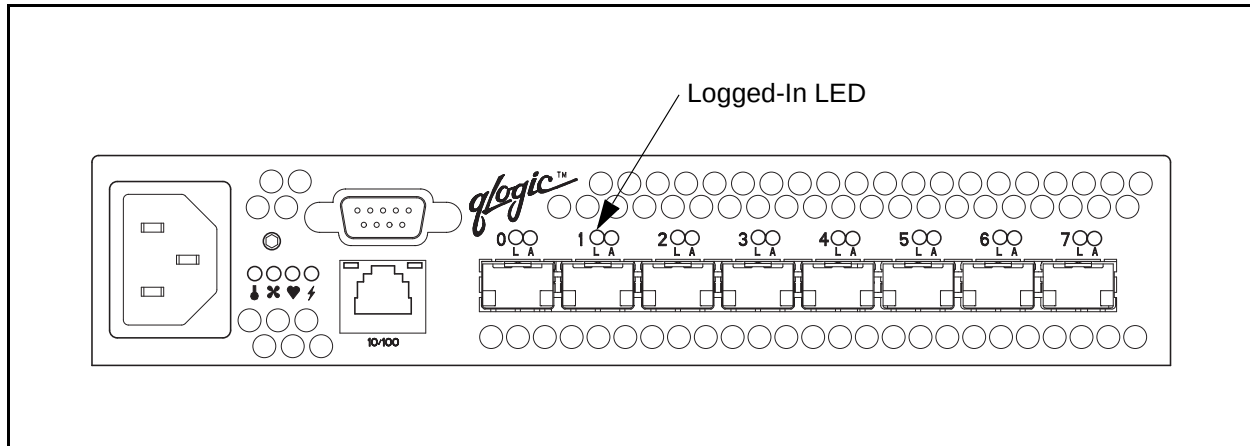


Figure 5-1. Port Logged-In LED

The Logged-In LED has three indications:

- Logged in - Continuous illumination.
- Logging in - Flashes at roughly once per second as shown in [Figure 5-2](#).
- Error - Flashes at roughly twice per second as shown in [Figure 5-2](#).

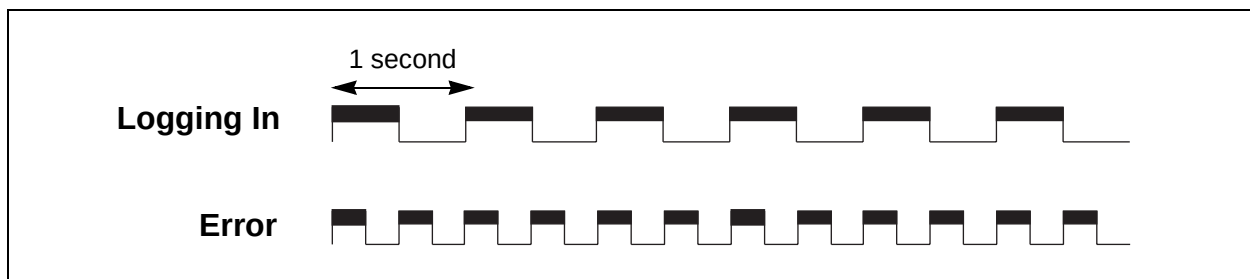


Figure 5-2. Logged-In LED Indications

A Logged-In LED error indication is often the result of E_Port isolation. An isolated E_Port is indicated by a red link in the topology display. [Table 5-1](#) describes the causes and remedies for E_Port isolation conditions.

Table 5-1. E_Port Isolation Causes and Remedies

Isolation Cause	Remedy
Two switches in the same fabric have the same domain ID	Correct the domain IDs on the offending switches. Domain IDs must be unique.
All switches in the fabric do not have the same timeout values	Correct the timeout values on the offending switches.
When merging two fabrics, the active zone sets contain zones with the same names but different membership.	Deactivate one of the active zone sets or edit the conflicting zones so that their membership is the same. The conflicting zones have the same name, but different membership. Finally, take the affected ports offline then back online to restore the inter-switch links.

If a Logged-In LED is flashing, do the following:

- Inspect the cable connecting the port to another switch or to a device. Is the cable connected and in good operating condition?
 - Yes - Continue.
 - No - Make necessary corrections or replace the cable.
- Inspect the switch or device to which the port is connected. Is the switch or device operating properly?
 - Yes - Continue.
 - No - Make necessary corrections. If the problem remains, continue.
- Replace the SFP. Does this correct the problem?
 - Yes - Diagnosis complete.
 - No - Continue.
- Inspect the switches in the fabric for domain ID, timeout value, or conflicting zone name problems. Do any of these conditions exist?
 - Yes - Reconfigure the switches as needed to eliminate the problem. Refer to the *SANbox2 Switch Management User's Guide* for information about how to change domain IDs, timeout values, and edit zoning.
 - No - Contact your authorized maintenance provider.

5.2

Chassis Diagnostics

Chassis diagnostics are indicated by the chassis LEDs as shown in [Figure 5-3](#).

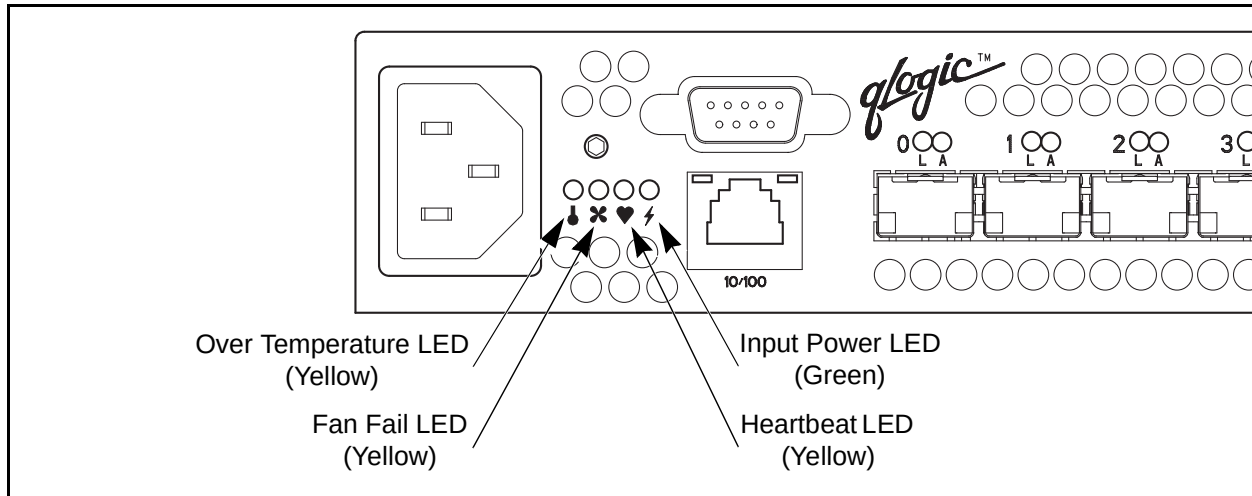


Figure 5-3. Chassis LEDs

The following conditions are described:

- Over Temperature LED is illuminated
- Input Power LED is extinguished
- Fan Fail LED is illuminated

5.2.1

Over Temperature LED is Illuminated

The Over Temperature LED illuminates to indicate that the switch logic circuitry is overheating. If the Over Temperature LED illuminates, do the following:

1. Inspect the chassis fan. Is the intake opening clear? Is the fan operating and producing air flow?
 - Yes - Continue.
 - No - Remove any debris from fan intake and exhaust if necessary. If the condition remains, continue.
2. Consider the ambient air temperature near the switch and clearance around the switch. Make necessary corrections. If the condition remains, contact your authorized maintenance provider.

5.2.2

Input Power LED Is Extinguished

The Input Power LED illuminates to indicate that the switch logic circuitry is receiving proper voltages. If the Input Power LED is extinguished, do the following:

1. Inspect the power cords and connectors. Is the cord unplugged? Is the cord or connector damaged?
 - Yes - Make necessary corrections or repairs. If the condition remains, continue.
 - No - Continue.
2. Inspect the AC power source. Is the power source delivering the proper voltage?
 - Yes - Continue
 - No - Make necessary repairs. If the condition remains, contact your authorized maintenance provider.

5.2.3

Fan Fail LED is Illuminated

The Fan Fail LED illuminates to indicate a malfunction with the chassis fan. If the Fan Fail LED illuminates, isolate the switch from the fabric, unplug the switch from the AC power source, and contact your authorized maintenance provider.

5.3

Recovering a Switch

A switch can become inoperable or unavailable for following reasons:

- Firmware becomes corrupt
- IP address is lost
- Switch configuration becomes corrupt
- Forgotten password

In these specific cases, you can recover the switch using force PROM mode. In force PROM mode, the switch IP address becomes 10.0.0.1 and provides opportunities to do the following:

- Reload firmware
- Reset the configuration IP address
- Reset the password to the factory default
- Remove a corrupt configuration
- Restore the factory configuration
- Copy the log file

To recover a switch, do the following:

1. Connect a workstation to the switch through the Ethernet connector. Refer to ["Connect the Management Workstation to the Switch" on page 4-10](#).
2. Before a switch can be recovered, you must upload the firmware to the switch. Refer to ["Loading Firmware" on page 4-14](#) for instructions on loading firmware using the SANbox Manager and using the File Transfer Protocol method. After uploading firmware, continue with the following steps to recover the switch.
3. Place the switch in force PROM mode. Do the following:
 - a. Isolate the switch from the fabric.
 - b. Press and hold the Reset/Force PROM button with a pointed tool for about 4 seconds. All of the chassis LEDs will illuminate then extinguish leaving only the Input Power LED illuminated. Release the button.
 - c. Allow about one minute for the switch to complete its tests and come up in force PROM mode. When the switch is in force PROM mode, the Input LED will be illuminated and the Heartbeat LED will illuminate continuously. All other chassis LEDs will be extinguished.
4. Establish a Telnet session with the switch using the default IP address 10.0.0.1.
5. Enter the account name (prom) and password (prom), and press the Enter key.


```
Sanbox2 login: prom
Password:xxxxx
[username@host:Itasca]% telnet 10.0.0.1
Trying 10.0.0.1...
Connected to 10.0.0.1.
Escape character is '^'.
```
6. The following text menu is displayed. To select a switch recovery option, press the corresponding number on the keyboard and press the Enter key.


```
0) Exit
1) Image Unpack
2) Reset Network Config
3) Reset Password File
4) Copy Log Files
5) Remove Switch Config
6) Remake Filesystem
7) Reset Switch
Option:
```

 - Choose the **Image Unpack** option to install the firmware on the switch.
 - Choose the **Reset Network Config** option to change the configuration IP address to 10.0.0.1.

- Choose the **Reset Password File** option to restore the default account name and password (Admin, Password).
- Choose the **Copy Log Files** option to copy the log file
- Choose the **Remove Switch Config** option to delete a corrupt configuration. This will reset the factory defaults for the switch, except for account names and passwords.
- Choose the **Remake Filesystem** option to reset the entire switch to the factory default settings. In the event of sudden loss of power, it is possible that the switch configuration may become corrupt. The file system on which the configuration is stored must be recreated.

CAUTION! If you choose the **Remake Filesystem** option, you will lose all changes made to the switch configuration, such as password and zoning changes. You must then reconfigure the portions of the fabric that involve the switch.

- Choose the **Reset Switch** option to reboot the switch using configuration parameters in memory.
7. To load the firmware image, press the number 1 key on the keyboard and press the Enter key.
Option: 1
 8. At the firmware image filename prompt, enter the name (*firmware*) of the firmware file and press the Enter key.
Image filename: firmware

Unpacking 'firmware', please wait...
Unpackage successful.
 9. Repeat the above procedures for each option, as necessary. Some options prompt you to confirm your choices. Press the "y" key for yes, and the "n" key for no.
 10. To exit force PROM mode and return to normal operation, wait about 15 seconds after the last operation, then reset the switch either by pressing the Reset/Force PROM button or power cycling the switch.

Appendix A Specifications

Appendix A contains the specifications for the SANbox2-8c Fibre Channel Switch. Refer to [Section 2 General Description](#) for the location of all connections, switches, and components.

A.1

Switch Specifications

Fibre Channel Protocols	FC-PH Rev. 4.3 FC-PH-2 FC-PH-3 FC-AL Rev 4.5 FC-AL-2 Rev 7.0 FC-FLA FC-GS-2 FC-FG FC-PLDA FC-Tape FC-VI FC-SW-2 Fabric Element MIB RFC 2837 Fibre Alliance MIB Version 3.0
Fibre Channel Classes of Service ..	Classes 2 and 3 connectionless
Fabric Port Modes	F_Port FL_Port TL_Port E_Port G_Port GL_Port
Port Characteristics	All ports are auto-discovering and self-configuring.
Number of Fibre Channel Ports	8 ports per chassis
Scalability.....	Maximum 239 switches depending on configuration
Maximum User Ports	>225,000 ports depending on configuration
Buffer Credits	12 buffer credits per port

Media Type	Small Form Pluggable (SFP), 3.3 volt, optical transceivers. Hot swappable.
Fabric Port Speed	1.0625 or 2.125 Gigabits/second
Maximum Frame Size	2148 bytes (2112 byte payload)
System Processor	266 MHz Pentium® processor
Fabric Latency (best case)	<0.5 µsec.
Fabric Point-to-Point Bandwidth	212 or 424 MB/s full duplex
Fabric Aggregate Bandwidth	32 Gb/s for a single switch

A.2 Switch Maintainability

Diagnostics	Power On Self Test (POST) tests all functional components except SFP transceivers. Port tests include online, internal, and external tests
User Interface	LED indicators

A.3 Fabric Management

Management Methods	SANbox Manager application Command Line Interface GS-3 Management Server SNMP FTP
Maintenance Connection	RS-232 connector; null modem F/F DB9 cable
Ethernet Connection	RJ-45 connector; 10/100 BASE T cable
Switch Agent	Allows a network management station to obtain configuration values, traffic information, and failure data pertaining to the Fibre Channels using SNMP through the Ethernet interface.

A.4

Switch Dimensions

Width.....	8.5"
Height	1.70"
Depth	20.0"
Weight.....	8.5 lbs.

A.5

Switch Electrical

Operating voltage	90 to 137 Vac; 47 to 63 Hz 180 to 264 Vac; 47 to 63 Hz
Power source loading	1.0 Amps maximum at 90 to 137 Vac 0.45 Amps maximum at 180 to 264 Vac
Heat Output (maximum)	70 watts
Circuit Protection	Internally fused

A.6

Switch Environmental

Temperature	
■ Operating	5 to 50°C (41 to 122°F)
■ Non-operating	-40 to 65°C (-40 to 149°F)
Humidity	
■ Operating	15% to 80%, non-condensing
■ Non-operating	25% to 90%, non-condensing
Altitude	
■ Operating	0 to 3048m (0 to 10,000 feet)
■ Non-operating	0 to 15,240m (0 to 50,000 feet)
Vibration	
■ Operating	IEC 68-2 5-500 Hz, random, 0.21 G rms, 10 minutes
■ Non-operating	5-500 Hz, random, 2.09 G rms, 10 minutes
Shock	
■ Operating	IEC 68-2 4 g, 11ms, 20 repetitions
■ Non-operating	30g, 292 ips, 3 repetitions, 3 axis
Air flow	Front-to-back or back-to-front, by model

A.7

Switch Regulatory Certifications

Safety Standards	UL60950, CSA 22.2 No. 60950, EN60950
Emissions Standards	FCC Part 15B Class A VCCI Class A ITE BSMI Class A ICES-03 Issue 3 CISPR 22, Class A EN 55022, Class A
Voltage Fluctuations	EN 61000-3-3
Harmonics.....	EN 61000-3-2
Immunity	EN 55024:1998
Marking	FCC Part 15, UL (United States), cUL (Canada), TUV, BSMI, VCCI, CE

A.8

Shortwave Laser SFP 1G/2G (multi-mode)

Connector	Duplex LC
Color coding.....	Beige or black exposed connector surfaces
Cable	Fibre Channel 100-M6-SN-I (50 µm multimode) Fibre Channel 200-M5-SN-I or 200-M6-SN-I (62.5 µm multimode)
Wavelength.....	830 - 860 nm
Transmit Power.....	-10 dBm minimum
Receiver Sensitivity	-16 dBm average
Distance	500 meters maximum, 50 micron fiber 300 meters maximum, 62.5 micron fiber
Safety.....	DHHS 21 CFR(J), IEC 825-1 CENELEC EN 60825-1, VDE
Standard	Small Form-Factor Pluggable Multisource Agreement

A.9

Longwave Laser SFP 1G/2G (single-mode)

Connector	Duplex LC
Color coding.....	Blue exposed connector surfaces
Cable	Fibre Channel 100SM-LC-L (9 µm single mode)
Wavelength.....	1270 - 13.5 nm
Transmit Power.....	-10 dBm minimum
Receiver Sensitivity	-20 dBm average
Distance	2 meters to 10 kilometers
Safety.....	DHHS 21 CFR(J), IEC 825-1 CENELEC EN 60825-1, VDE
Standard	Small Form-Factor Pluggable Multisource Agreement

Notes

Appendix B

Command Line Interface

Each SANbox2 switch contains a Telnet server. This server allows a Telnet client to establish a Telnet session with the switch to retrieve information or to configure parameters. The Command Line Interface (CLI) enables you to perform a variety of fabric and switch management tasks through an Ethernet or a serial port connection to a switch.

B.1

Logging On to a Switch

To log on to a switch using Telnet, open a command line window on the management workstation and enter the Telnet command followed by the switch IP address:

```
/> telnet 123.45.67.890
```

A Telnet window opens prompting you for a SANbox2 login. Enter an account name and password. Switches come from the factory with the following user account already defined:

```
Account name: admin
Password: password
Authority: Admin
```

This user account provides full access to the switch and its configuration. After planning your fabric management needs and creating your own user accounts, consider changing the password for this account. Refer to ["Commands" on page B-3](#) for more information about authority levels. Refer to the ["User Command" on page B-59](#) for information about creating and deleting user accounts.

Note: The switch supports a combined maximum of 15 logins. This includes SANbox Manager inband and out-of-band logins, Telnet out-of-band logins, and SNMP out-of-band logins. Additional logins will be refused.

B.2

Command Syntax

The command syntax is as follows:

command

keyword

keyword *[value]*

keyword [value1] [value2]

The **Command** is followed by one or more keywords. Consider the following rules and conventions:

- Commands and keywords are lowercase and case sensitive.
- Commands with keywords require one of those keywords.
- Required keyword values appear in standard font: [value]. Optional values are shown in italics: *[value]*.
- Underlined portions of the keyword in the command format indicate the abbreviated form that can be used. For example the Delete keyword can be abbreviated Del.

B.3 Commands

The Command Line Interface provides for User and Admin authority levels.

- User authority grants viewing access to the fabric and switches using the Show command and other read-only commands.
- Admin authority includes the User authority and grants permission to use the Admin command. The Admin Start command opens an admin session which provides access to the commands that change switch and fabric configurations. Refer to the ["Admin Command" on page B-4](#).

Note: Admin authority is enforced only if fabric security is enabled on the switch. By default, fabric security is disabled. Refer to the System keyword of the ["Set Setup Command" on page B-34](#) for information about setting fabric security.

The commands and their page numbers are listed by authority level in [Table B-1](#).

Table B-1. Commands Listed by Authority Level

User Authority Commands	Admin Authority Command
Date (B-9)	Admin (B-4)
Help (B-11)	Admin Session Commands
History (B-12)	
Ps (B-16)	Alias ¹ (B-5)
Quit (B-17)	Config ¹ (B-7)
Set Beacon (B-23)	Fallback (B-10)
Show (B-39)	Image (B-13)
Show Config (B-48)	Lip (B-14)
Show Log (B-50)	Passwd (B-15)
Show Perf (B-52)	Reset (B-18)
Show Setup (B-53)	Set Alarm Clear (B-22)
Uptime (B-58)	Set Config (B-24)
Whoami (B-61)	Set Log (B-30)
	Set Port (B-33)
	Set Setup (B-34)
	Set Switch (B-38)
	Shutdown (B-55)
	Test (B-56)
	User ¹ (B-59)
	Zone ¹ (B-62)
	Zoneset ¹ (B-65)
	Zoning ¹ (B-67)

¹Some keywords are available with User authority.

Admin Command

Opens and closes an Admin session granting Admin authority. The Admin session provides commands that change the fabric and switch configurations. Only one Admin session can be open in the fabric at any time. An inactive Admin session will time out after a period of time which can be changed using the Set Setup System command. Refer to the ["Set Setup Command" on page B-34](#).

Authority Admin

Syntax **admin**
start
end
cancel

Keywords **start**
Opens the Admin session.

end
Closes the Admin session.

cancel
Terminates an Admin session opened by another user. Use this keyword with care because it terminates the Admin session without warning the other user and without saving pending changes.

Examples The following example shows how to open and close an Admin session:

```
SANbox2 $> admin start
```

```
SANbox2 (admin) #>
```

```
.  
.  
.
```

```
SANbox2 (admin) #> admin end
```

```
SANbox2 #>
```

Alias Command

Creates a named set of ports. Aliases make it easier to assign a set of ports to many zones. An alias can not have a zone or another alias as a member.

Authority Admin

Syntax **alias**
 add [alias] [members]
 copy [alias_source] [alias_destination]
 create [alias]
 delete [alias]
 list
 members [alias]
 remove [alias] [members]
 rename [alias_old] [alias_new]

Keywords **add [alias] [members]**
 Specifies one or more ports given by [members] to add to the alias named [alias]. [members] can have one of the following formats:

- Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.
- 6-character device Fibre Channel address (hex)
- 16-character hexadecimal worldwide port name (WWPN) with the format xx:xx:xx:xx:xx:xx:xx:xx.

The application verifies that the [alias] format is correct, but does not validate that such a port/device exists.

copy [alias_source] [alias_destination]

Creates a new alias named [alias_destination] and copies the membership into it from the alias given by [alias_source].

create [alias]

Creates an alias with the name given by [alias]. The alias name can have a maximum of 64 characters.

delete [alias]

Deletes the specified alias given by [alias] from the zoning database. If the alias is a member of the active zone set, the alias will not be removed from the active zone set until the active zone set is deactivated.

list

Displays a list of all aliases. This keyword is valid for User authority and does not require a zoning edit session or an admin session.

members [alias]

Displays all members of the alias given by [alias]. This keyword is available with User authority and does not require a zoning edit session or an admin session.

remove [alias] [members]

Removes the ports given by [members] from the alias given by [alias]. [members] can have one of the following formats:

- Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.
- 6-character device Fibre Channel address (hex)
- 16-character hexadecimal worldwide port name (WWPN) for the device with the format xx:xx:xx:xx:xx:xx:xx:xx.

rename [alias_old] [alias_new]

Renames the alias given by [alias_old] to the alias given by [alias_new].

Config Command

Manages the Fibre Channel configurations on a switch. For information about setting the port and switch configurations, refer to the ["Set Config Command" on page B-24](#).

Authority Admin for all keywords except List

Syntax **config**
 `activate [config]`
 `backup`
 `cancel`
 `copy [config_source] [config_destination]`
 `delete [config]`
 `edit [config]`
 `list`
 `restore`
 `save [config]`

Keywords **`activate [config]`**
Activates the configuration given by [config]. If you omit the configuration, the currently active configuration is used. SANbox2-8c supports up to 10 configurations (only one can be active at a time).

`backup`
Creates a file named *configdata*, which contains the system configuration information. This file should be downloaded from the switch using FTP and stored in a safe place.

`cancel`
Terminates the current configuration edit session without saving changes that were made.

`copy [config_source] [config_destination]`
Copies the configuration given by [config_source] to the configuration given by [config_destination].

`delete [config]`
Deletes the specified configuration file where [config] is a file name.

`edit [config]`
Opens the an edit session for the configuration given by [config]. If you omit the configuration name, the currently active configuration is used. SANbox2-8c supports up to 10 configurations (only one can be active at a time).

`list`
Displays a list of all available configurations. This keyword is available with User authority.

restore

Restores configuration settings to the switch from a backup file named *configdata*, which must be first uploaded on the switch using FTP. You create the backup file using the Config Backup command. Use FTP to load the backup file on a switch, then enter the Config Restore command.

save [config]

Saves changes made during a configuration edit session in the configuration given by [config]. If you omit the configuration name value, the configuration you chose for the Config Edit command is used.

Notes

If you edit the active configuration, changes will be held in suspense until you reactivate the configuration or activate another configuration.

Examples

The following shows an example of how to open and close a Config Edit session:

```
SANbox2 $> admin start
```

```
SANbox2 (admin) #> config edit
```

```
.  
.   
.
```

```
SANbox2 (admin-config) #> config cancel
```

```
Configuration mode will be canceled.Please confirm (y/n): [n] y
```

```
SANbox2 (admin) #> admin end
```

```
SANbox2 $>
```

Date Command

This command displays or sets the system date and time. To set the date and time the information string must be provided in this format: MMDDhhmmCCYY

Authority Admin

Syntax **date**
[MMDDhhmmCCYY]

Keywords [MMDDhhmmCCYY]
Specifies the date. If you omit the keyword value, the current date is displayed.

Examples The following is an example of the Date command:

```
SANbox2 $> date  
Tue Jun 12 07:51:24 2001
```

Fallback Command

Loads the fallback version of the firmware from switch memory. The switch stores two versions of the firmware. This command alternately activates the two versions.

Authority Admin

Syntax **fallback**

Notes

- The Show Switch command displays the available firmware versions and the currently active version.
- After executing the Fallback command, reset the switch for the firmware to placed in effect.

Examples The following is an example of the Fallback command:

```
SANbox2 $> admin start
```

```
SANbox2 (admin) #> fallback
```

```
Reverting to previous software image. Please confirm (y/n): [n] y
```

```
SANbox2 $> admin end
```

```
SANbox2 $>
```

Help Command

Displays a brief description of the specified command and its keywords.

Authority User

Syntax **help** [*command*] [*keyword*]

Keywords [*command*]

A command name. If you omit this value, the system displays all available commands from which to choose.

[*keyword*]

A keyword associated with the command named by [*command*]. If you omit this value, the system displays the available keywords for the specified command.

all

Displays a list of all available commands (including command variations).

Examples The following is an example of the Help Set command:

```
SANbox2 $> help set
```

```
set SET_OPTIONS
```

There are many attributes that can be set.

Type help with one of the following to get more information:

```
set beacon
```

```
set config port
```

```
set config ports
```

```
set config switch
```

```
set log
```

```
set port
```

```
set setup snmp
```

```
set setup system
```

```
set switch
```

The following is an example of the Help Set Beacon command:

```
SANbox2 $> help set beacon
```

```
set beacon On | Off
```

This command allows the lights on the front of the switch to flash.

The On option will start and the Off option will stop the flashing.

History Command

Displays a numbered list of the previously entered commands from which you can re-execute selected commands.

Authority User

Syntax **history**

Notes Use the History command to provide context for the ! command:

- Enter ![command] to re-enter the most recent execution of that command.
- Enter ![line number] to re-execute the corresponding command from the History display
- Enter ![partial command string] to re-execute a command that matches the command string.
- Enter !! to re-execute the most recent command.

Examples The following is an example of the History command:

```
SANbox2 $> history
```

```
1 show switch
2 date
3 help set
4 history
```

```
SANbox2 $> !3
```

```
help set
```

```
set SET_OPTIONS
```

```
There are many attributes that can be set.
```

```
Type help with one of the following to get more information:
```

```
set beacon
set config port
set config ports
set config switch
set log
set port
set setup snmp
set setup system
set switch
```

Image Command

Manages and installs switch firmware.

Authority Admin

Syntax **image**
cleanup
fetch [account_name] [ip_address] [file_source] [file_destination]
list
unpack [file]

Keywords **cleanup**
Removes the firmware image file from the switch. The firmware image file is removed automatically each time the switch is reset.

fetch [account_name] [ip_address] [file_source] [file_destination]
Retrieves image file given by [file_source] and stores it on the switch with the file name given by [file_destination]. The image file is retrieved from the device with the IP address given by [ip_address] and an account name given by [account_name]. If an account name needs a password to access the device, the system will prompt you for it.

list
Displays the list of image files that reside on the switch.

unpack [file]
Installs the firmware file given by [file]. After unpacking the file, a message appears confirming successful unpacking. The switch must be reset for the new firmware to take effect.

Lip Command

Reinitializes the specified loop port.

Authority Admin

Syntax lip [port_number]

Keywords [port_number]
The number of the port to be reinitialized.

Examples The following is an example of the Lip command:

```
SANbox2 (admin) #> lip 2
```

Passwd Command

Changes a user account's password.

Authority Admin

Syntax **passwd [account_name]**

Keywords **[account_name]**
The user account name.

Examples The following is an example of the Passwd command:

```
SANbox2 (admin) #> passwd user2
```

```
Press 'q' and the ENTER key to abort this command.
```

```
account OLD password          :  
account NEW password (4-20 chars) :
```

```
please confirm account NEW password:
```

```
password has been changed.
```

Ps Command

Displays current system process information.

Authority User

Syntax **ps**

Examples The following is an example of the Ps command:

```
SANbox2 $> ps
```

PID	PPID	%CPU	TIME	ELAPSED	COMMAND
298	292	0.0	00:00:00	59:42	cns
299	292	0.0	00:00:00	59:42	ens
300	292	0.0	00:00:00	59:42	dlog
301	292	0.3	00:00:53	59:42	ds
302	292	0.2	00:00:29	59:42	mgmtApp
303	292	0.0	00:00:02	59:42	nserver
304	292	0.0	00:00:00	59:42	mserver
305	292	0.1	00:00:15	59:42	util
306	292	0.0	00:00:04	59:42	eport
307	292	1.2	00:02:53	59:41	PortApp
308	292	0.0	00:00:01	59:41	zoning
309	292	0.0	00:00:00	59:41	diagApp

Quit Command

Closes the Telnet session.

Authority User

Syntax **quit, exit, or logout**

Reset Command

Resets the switch and port configuration parameters.

Authority Admin

Syntax **reset**
 config
 factory
 port [port_number]
 snmp
 switch (default)
 system
 zoning

Keywords **config**
Resets the configuration settings for the switch and its ports to the factory default values. Refer to [Table B-2](#) and [Table B-3](#) for switch and port configuration default values.

factory
Resets switch, port, SNMP, and system configuration settings to the factory default values. Refer to [Table B-2](#) through [Table B-5](#).

port [port_number]
Reinitializes the port given by [port_number]. Ports are numbered beginning with 0.

snmp
Resets the SNMP configuration settings to the factory default values. Refer to [Table B-4](#) for SNMP configuration default values.

switch
Reinitializes the switch. This command also closes the Telnet session.

system
Resets the system configuration settings to the factory default values. Refer to [Table B-5](#) for system configuration default values.

zoning
Resets the zoning configuration settings to the factory default settings. This keyword clears all zoning definitions on the switch.

Notes The following tables specify the various factory default settings:

Table B-2. Switch Configuration Defaults

Parameter	Default
Admin State	Online
Broadcast Enable	False
Domain ID	1
Domain ID Lock	True
Symbolic Name	SANbox2
R_T_TOV	100
R_A_TOV	10000
E_D_TOV	2000
FS_TOV	5000
DS_TOV	5000
Principal Priority	254
Description	Undefined

Table B-3. Port Configuration Defaults

Parameter	Default
Admin State	Online
Link Speed	Auto
Port Type	GL
TL_Port Mode	True
ISL Security	Any
Symbolic Name	Port
ALFairness	False
ARB_FF	False
InteropCredit	0
ExtCredit	0
FanEnable	True

Table B-3. Port Configuration Defaults (Continued)

Parameter	Default
LCFEnable	False
MFSEnable	False
MFS_TOV	640
MSEnable	True
NoClose	False
IOStreamGuard	False
VIEnable	False
CheckAlps	False

Table B-4. SNMP Configuration Defaults

Parameter	Default
Contact	Undefined
Location	Undefined
Description	Undefined
Trap [1-5] Enabled	False
Trap [1-5] Address	127.0.0.1
Trap [1-5] Port	Undefined
Trap [1-5] Severity	Warning
ObjectID	1663.1.1.1.1.111.3.6.1.4.1
AuthFailureTrap	False

Table B-5. System Configuration Defaults

Parameter	Default
Network IP Address	10.0.0.1
Network IP Mask	255.0.0.0
Gateway Address	10.0.0.254
Network Discovery	Static
Admin Timeout	30 minutes
Security Enabled	False
Remotelog Enabled	False
LogHost IP Address	Undefined

Set Alarm Clear Command

Clears the log (list) of alarms.

Authority User

Syntax **set alarm clear**

Examples The following example clears the list of alarms.

```
SANbox2 $> set alarm clear
```

Set Beacon Command

Assists in locating a switch by causing all port Logged-In LEDs on the switch to flash.

Authority User

Syntax **set beacon [state]**

Keywords **[state]**

Enables or disables the flashing of the port Logged-In LEDs according to [state].

On

Enables the flashing beacon.

Off

Disables the flashing beacon.

Examples The following examples enables and disables the beacon:

```
SANbox2 $> set beacon on
```

```
Command succeeded.
```

```
SANbox2 $> set beacon off
```

```
Command succeeded.
```

Set Config Command

Sets switch, port, and zoning configuration parameters.

Authority Admin authority within a Config Edit session

Syntax **set config**
 port *[port_number]*
 ports *[port_number]*
 switch
 zoning

Keywords **port *[port_number]***
Changes configuration parameters for the port number given by *[port_number]*. If you omit this value, the system begins with port 0 and proceeds in order through port 15 or until you enter “qq”. The system displays each parameter one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

ports *[port_number]*
Very similar to the Set Config Port command, except that any attribute value that is changed by the user is applied to ALL ports. ONLY attribute values that are changed are updated; the attribute values that are not changed are left alone. Ports are numbered beginning with 0. The default is port 0. The system displays each parameter one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets. Admin and config edit modes are required for this command.

Table B-6. Set Config Port Parameters

Parameter	Description
AdminState	Port administrative state: online, offline, diagnostics, or down.
LinkSpeed	1Gb/sec or 2 Gb/sec
PortType	Type of port
TLPortMode	Initiates the configuration of ports attributes. Indicates whether using initiator or target devices on the loop. If <i>[port_number]</i> is specified then the user will be presented with attributes for that port only; otherwise, all attributes for all ports will be available for configuration.

Table B-6. Set Config Port Parameters (Continued)

Parameter	Description
ISLSecurity	E_Port security. Determines which switches a port will establish a link with. ■ ANY - we will link with any switch. ■ Ours - we will only link to another SANbox2 switch. ■ None - the port will not establish an ISL link.
SymbolicPortName	Descriptive name
ALFairness	Default is switch that has priority
ARB_FF	Use ARB_FF instead of idles on loop FCAL option
InteropCredit	Number of buffer-to-buffer credits per port. 0 means the default (12) is unchanged.
ExtCredit	Extended credit port
FANEnable	Fabric Address Notification. If enabled, notifies logged-in NL_Ports of the FL_Ports's address, port name, and node name.
LCFEnable	Link control frame preference, R_CTL = 0xC
MFSEnable	Multi-Frame Sequence bundling
MFS_TOV	MFS limit for camp on
MSEnable	Management Server enable on this port
NoClose	Don't close unless another devices arbitrates
I/O Stream Guard	Enables or disables the suppression of RSCN messages
VIEnable	Enable VI preference routing
CheckAlps	Close before sending frames to new target

switch

Initiates an editing session in which to change switch configuration settings. The system displays each parameter one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table B-7. Set Config Switch Parameters

Parameter	Description
AdminState	Switch administrative state: online, offline, or diagnostics.
Broadcast Enable	Enables or disables (default) forwarding if broadcasting frames.
DefaultDomainID	Default domain ID setting
DomainIDLock	If set to True (default), prevents domain ID from being changed.
SymbolicName	Descriptive name
R_T_TOV	Receiver Transmitter Timeout Value. Specifies the number of milliseconds a port is to wait to receive a response from another port. The default is 100.
R_A_TOV	Resource Allocation Timeout Value. The number of milliseconds the switch waits to allow two ports to allocate enough resources to establish a link. The default is 10000.
E_D_TOV	Error Detect Timeout Value. The number of milliseconds a port is to wait for errors to clear. The default is 2000 msec.
FS_TOV	Fabric Stability Timeout Value. The default is 5000 msec.
DS_TOV	Distributed Services Timeout Value (Management Server, Name Server). The default is 5000 msec.
PrincipalPriority	The priority used in the FC-SW-2 principal switch selection algorithm. 1 is high, 255 is low.
Description	The name for the configuration. The default is undefined.

zoning

Initiates an editing session in which to change switch zoning attributes. The system displays each parameter one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table B-8. Set Config Zoning Parameters

Parameter	Description
AutoSave	Determines whether zoning changes will be saved to flash (non-volatile) memory or to RAM (volatile) in each switch. The default is On.
Default	Determines communication among ports/devices in the absence of an active zone set. "All" enables all ports/devices to communicate with one another. "None" prohibits communication among ports/devices.
Merge Mode	Enables SANbox2 switch to interoperate with Brocade™ switches running non-FC-SW-2 compliant firmware.

Examples

The following is an example of the Set Config Port command:

```
SANbox2 $> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config port 1
```

A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the default value.
If you wish to terminate this process before reaching the end of the list
press 'q' or 'Q' and the ENTER key to do so.

Configuring Port Number: 1

```
AdminState    (1=Online, 2=Offline, 3=Diagnostics, 4=Down) [Online]
LinkSpeed     (1=1Gb/s, 2=2Gb/s, 3=Auto)           [Auto ]
PortType      (TL / GL / G / F / FL / Donor)        [GL   ]
TLPortMode    (1=TLTargetMode, 2=TLInitiatorMode)   [TLInitiatorMode]
ISLSecurity   (Any / Ours / None)                   [Any  ]
SymPortName   (string, max=32 chars)                [Port2 ]
ALFairness    (True / False)                       [False ]
```

```

ARB_FF          (True / False)          [False ]
InteropCredit   (decimal value, 0-255)   [0      ]
ExtCredit       (decimal value, 0-65535) [0      ]
FANEnable       (True / False)          [True  ]
LCFEnable       (True / False)          [False ]
MFSEnable       (True / False)          [False ]
MFS_TOV         (decimal value, 10-20480 msec) [640   ]
MSEnable        (True / False)          [True  ]
NoClose         (True / False)          [False ]
I/O Stream Guard -
                  (Suppress RSCN)(Enable / Disable) [Disable]
VIEnable        (True / False)          [False ]
CheckAlps       (True / False)          [False ]

```

Finished configuring attributes.

This configuration must be saved (see config save command) and activated (see config activate command) before it can take effect.

To discard this configuration use the config cancel command.

The following is an example of the Set Config Switch command:

```

SANbox2 $> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

```

A list of attributes with formatting and default values will follow.
Enter a new value or simply press the ENTER key to accept the default value.
If you wish to terminate this process before reaching the end of the list press 'q' or 'Q' and the ENTER key to do so.

```

AdminState      (1=Online, 2=Offline, 3=Diagnostics) [Online      ]
BroadcastEnable  (True / False)                      [False       ]
DefaultDomainID  (decimal value, 1-239)               [11          ]
DomainIDLock     (True / False)                      [True        ]
SymbolicName     (string, max=32 chars)               [bottom switch]
R_T_TOV          (decimal value, 1-1000 msec)         [100         ]
R_A_TOV          (decimal value, 100-100000 msec)     [10000       ]
E_D_TOV          (decimal value, 10-20000 msec)       [2000        ]
FS_TOV           (decimal value, 100-100000 msec)     [5000        ]
DS_TOV           (decimal value, 100-100000 msec)     [5000        ]
PrincipalPriority (decimal value, 1-255)              [254         ]
Description      (string, max=32 chars)               [             ]

```

The following is an example of the Set Config Zoning command.

```
SANbox2 $> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config zoning
```

A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the default value.
If you wish to terminate this process before reaching the end of the list
press 'q' or 'Q' and the ENTER key to do so.

```
AutoSave      (True / False) [True]
Default       (All / None)  [All ]
Merge Mode    (Brocade / SW2) [SW2 ]
```

Finished configuring attributes.

This configuration must be saved (see config save command) and
activated (see config activate command) before it can take effect.
To discard this configuration use the config cancel command.

Set Log Command

Specifies the type of entries to be entered in the event log. The log is a storage file contained on the switch. The log can hold a maximum of 200 entries. When the log becomes full, the entries are replaced, starting with the oldest entry, to produce a list of the last 200 events which occurred. Log entries are created for ports, components, and event severity levels, based on the settings defined for the active configuration.

Authority Admin

Syntax **set log**
archive
clear
component [list]
level [level]
port [ports]
restore
save
start (default)
stop

Keywords **archive**
Archives the log entries to a file on the switch named *logfile* that can be downloaded from the switch using FTP. (FTP to the switch, log in with username/password of "images" for both, and type "get logfile".)

clear
Clears all log entries.

component [list]
Specifies one or more components to monitor for events. Use spaces to delimit values in the list. Choose one or more of the following values:

- All
Monitors all components. To maintain optimal switch performance, do not use this setting with the Level keyword set to Info.
- Blade
Monitors modular circuit boards in cabinets, racks, and high-port-count switches.
- Chassis
Monitors chassis hardware components such as fans and power supplies.
- Eport
Monitors all E_Ports.
- MgmtServer
Monitors management server status.
- NameServer
Monitors name server status.

None
Monitor none of the component events.

Other
Monitors other miscellaneous events.

Port
Monitors all port events

Switch
Monitors switch management events.

Zoning
Monitors zoning conflict events.

level [level]

Specifies the severity level given by [level] to use in monitoring events for the specified components or ports. [level] can be one of the following values:

Critical
Monitors critical events.

Warn
Monitors warning events.

Info
Monitors informational events. To maintain optimal switch performance, do not use this setting with the Component keyword set to All.

None
Monitors none of the severity levels.

port [ports]

Specifies one or more ports to monitor for events. Choose one of the following values:

<port number list>
Specifies port or ports to monitor. Use spaces to delimit values in the list. Ports are numbered beginning with 0.

All
Specifies all ports.

None
Disables monitoring on all ports.

restore

Returns the port, component, and level settings to the default values.

save

Saves the log settings for the component, level and port. These settings remain in effect after a switch reset. To retrieve the actual log entries, refer to the Set Log Archive command.

start

Starts the logging of events based on the Port, Component, and Level keywords assigned to the active configuration. The logging continues until you enter the Set Log Stop command.

stop

Stops logging of events.

Notes

To maintain optimal switch performance, do not set the Component keyword to All and the Level keyword to Info at the same time.

Set Port Command

Sets port state and speed for the specified port temporarily until the next switch reset or new configuration activation. This command also clears port counters.

Authority Admin

Syntax **set port [port_number]**
bypass
clear
enable
speed [transmission_speed]
state [admin_state]

Keywords **[port_number]**
Specifies the port. Ports are numbered beginning with 0.

bypass

Sends a Loop Port Bypass (LPB) to a specific Arbitrated Loop Physical Address (ALPA) or to all ALPAs on the arbitrated loop.

clear

Clears the counters on the specified port.

enable

Sends a Loop Port Enable (LPE) to all ALPAs on the arbitrated loop.

speed [transmission_speed]

Specifies the transmission speed for the specified port. Choose one of the following port speed values:

1Gb/s
One gigabit per second.

2Gb/s
2 gigabits per second.

Auto
The port speed is automatically detected.

state [admin_state]

Specifies the administrative state for the specified port. Choose one of the following port state values:

Online
Places the port online.

Offline
Places the port offline.

Diagnostics
Prepares the port for testing.

Down
Disables the port.

Set Setup Command

Changes SNMP and system configuration settings. The switch maintains one SNMP configuration and one system configuration.

Authority Admin

Syntax **set setup**
snmp
system

Keywords **snmp**
Prompts you in a line-by-line fashion to change SNMP configuration settings. [Table B-9](#) describes the SNMP fields. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table B-9. SNMP Configuration Settings

Entry	Description
Contact	Specifies the name of the person to be contacted to respond to trap events. The default is undefined.
Location	Specifies the switch location. The default is undefined.
Trap [1-5] Enabled	Specifies whether traps (event information) are enabled or disabled (default).
Trap [1-5] Address	Specifies the IP address to which SNMP traps are sent. The default is 127.0.0.1.
Trap [1-5] Port	Specifies the port for which SNMP traps are sent.
Trap [1-5] Severity	Specifies the severity level to use when monitoring trap events. The default is Warning
ReadCommunity	Read Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same.
WriteCommunity	Write Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same.
TrapCommunity	Trap Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same.
AuthFailureTrap	Specifies the IP address where a notification is sent in the event of an authentication failure.

system

Prompts you in a line-by-line fashion to change system configuration settings.

[Table B-10](#) describes the system configuration fields. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table B-10. System Configuration Settings

Entry	Description
NetworkIPAddress	Internet Protocol (IP) address for the Ethernet port.
NetworkIPMask	Subnet mask address for the Ethernet port.
GatewayIPAddress	IP address gateway.
NetworkDiscovery	Boot Method (1 - Static, 2 - Bootp, 3 - DHCP, 4 - RARP)
AdminTimeout	Specifies the amount of time in minutes the switch waits before terminating an idle Admin session. Zero (0) disables the time out threshold. The default is 30, the maximum is 1440.
Security Enabled	Enables or disables the enforcement of account names and passwords.
Remote Log Enabled	Whether remote logging of is enabled or disabled. If enabled, log information is saved to a remote host that supports the syslog protocol.
LogHost IP Address	The IP address of the host that will receive the remote log information if remote logging is enabled.

Notes

The two components of SANbox2 security are user authentication and fabric security. The user must be authenticated before gaining access to a switch. If an invalid account name/password combination is entered, that user can not access the switch, and thus can not gain access to the fabric. If security is enabled (on) and a valid account name/password combination is entered, that user can access the switch but can not execute any command that exceeds their authority (privileges) level. If security is disabled (off) and a valid account name/password combination is entered, that user has access to all switches in the fabric and can execute all commands (both user and admin), regardless of their authority (privileges) level.

Examples The following is an example of the Set Setup SNMP command:

```
SANbox2 $> admin start
```

```
SANbox2 (admin) #> set setup snmp
```

A list of attributes with formatting and current values will follow.

Enter a new value or simply press the ENTER key to accept the default value.

If you wish to terminate this process before reaching the end of the list
press 'q' or 'Q' and the ENTER key to do so.

Trap Severity Options

unknown, emergency, alert, critical, error, warning, notify, info, debug

Contact	(string, max=32 chars)	[Technical Support]
Location	(string, max=32 chars)	[TSLab]
Trap1Enabled	(True / False)	[True]
Trap1Address	(dot-notated IP Address)	[10.20.71.15]
Trap1Port	(decimal value)	[162]
Trap1Severity	(see allowed options above)	[warning]
Trap2Enabled	(True / False)	[False]
Trap2Address	(dot-notated IP Address)	[0.0.0.0]
Trap2Port	(decimal value)	[162]
Trap2Severity	(see allowed options above)	[warning]
Trap3Enabled	(True / False)	[False]
Trap3Address	(dot-notated IP Address)	[0.0.0.0]
Trap3Port	(decimal value)	[162]
Trap3Severity	(see allowed options above)	[warning]
Trap4Enabled	(True / False)	[False]
Trap4Address	(dot-notated IP Address)	[0.0.0.0]
Trap4Port	(decimal value)	[162]
Trap4Severity	(see allowed options above)	[warning]
Trap5Enabled	(True / False)	[False]
Trap5Address	(dot-notated IP Address)	[0.0.0.0]
Trap5Port	(decimal value)	[162]
Trap5Severity	(see allowed options above)	[warning]
ReadCommunity	(string, max=32 chars)	[public]
WriteCommunity	(string, max=32 chars)	[private]
TrapCommunity	(string, max=32 chars)	[public]
AuthFailureTrap	(True / False)	[False]

Do you want to save and activate this snmp setup? (y/n)

The following is an example of the Set Setup System command:

```
SANbox2 $> admin start
SANbox2 (admin) #> set setup system
```

A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the default value.
If you wish to terminate this process before reaching the end of the list
press 'q' or 'Q' and the ENTER key to do so.

NetworkIPAddress	(dot-notated IP Address)	[172.22.10.170]
NetworkIPMask	(dot-notated IP Address)	[255.255.252.0]
GatewayIPAddress	(dot-notated IP Address)	[172.22.8.254]
NetworkDiscovery	(1=Static, 2=Bootp, 3=Dhcp, 4=Rarp)	[Dhcp]
AdminTimeout	(dec value 0-1440 minutes, 0=never)	[30]
SecurityEnable	(True / False)	[False]
RemoteLogEnable	(True / False)	[False]
LogHost IP Address	(True / False)	[False]

Set Switch Command

Temporarily changes the administrative state for all ports on the switch. The previous Set Config Switch settings are restored after a switch reset or a reactivation of a switch configuration.

Authority Admin

Syntax **set switch**
state [admin_state]

Keywords **state [admin_state]**
Specifies the administrative state as given by [admin_state]:

- Online
Places all ports online
- Offline
Places all ports offline.
- Diagnostics
Prepares all ports for testing.

Show Command

Displays fabric, switch, and port operational information.

Authority User

Syntax **show**
 about
 alarm
 broadcast
 chassis
 config [option]
 domains
 donor
 fabric
 intro
 log [option]
 lsdb
 mem [count]
 ns
 perf [option]
 port [port_number]
 setup [option]
 steering [domain_id]
 switch
 topology
 users

Keywords **about**
 Displays an introductory set of information about operational attributes of the switch. It is functionally equivalent to the Show Intro command.

alarm
 Displays the last 200 alarm entries.

broadcast
 Displays the broadcast tree information and all ports that are currently transmitting and receiving broadcast frames.

chassis
 Displays chassis component status and temperature.

config [option]
 Displays switch and port configuration attributes. Refer to the ["Show Config Command" on page B-48](#).

domains
 Displays list of each domain and its worldwide name in the fabric.

donor
 Displays list of current donor configuration for all ports.

fabric

Displays list of each domain, fabric ID, worldwide name, node IP address, port IP address, and symbolic name in the fabric.

intro

Displays an introductory set of information about operational attributes of the switch. It is functionally equivalent to the Show About command.

log [option]

Displays log entries. Refer to the ["Show Log Command" on page B-50](#).

lsdb

Displays Link State database information.

mem [count]

Displays information about memory activity in 1K block units. [count] is the number of updates at 1 second intervals.

ns

Displays name server information.

perf [option]

Displays performance information for all ports. Refer to the ["Show Perf Command" on page B-52](#).

port [port_number]

Displays operational information for the port given by [port_number]. Ports are numbered beginning with 0. If the port number is omitted, information is displayed for all ports. [Table B-11](#) describes the port parameters.

Table B-11. Show Port Parameters

Entry	Description
Alinit	Incremented each time the port begins AL initialization.
AlinitError	Number of times the port entered initialization and the initialization failed.
ClassXFramesIn	Number of class x frames received by this port.
ClassXFramesOut	Number of class x frames sent by this port.
ClassXWordsIn	Number of class x words received by this port.
ClassXWordsOut	Number of class x words sent by this port.
DecodeError	Decoding error detected.

Table B-11. Show Port Parameters (Continued)

Entry	Description
FBusy	Number of times the switch sent a P_BSY because Class 2 frame could not be delivered within ED_TOV time. Number of class 2 and class 3 fabric busy (F_BSY) frames generated by this port in response to incoming frames. This usually indicates a busy condition on the fabric or N_port that is preventing delivery of this frame.
Flowerrors	Received a frame when there were no available credits.
FReject	Number of frames from devices that were rejected.
InvalidCRC	Invalid CRC detected.
InvalidDestAddr	Invalid destination address detected.
LIP ALPD ALPS	Number of F7, AL_PS LIPs, or AL_PD (vendor specific) resets, performed.
LIPF7ALPS	This LIP is used to reinitialize the loop. An L_port, identified by AL_PS, may have noticed a performance degradation and is trying to restore the loop.
LIPF8ALPS	This LIP denotes a loop failure detected by the L_port identified by AL_PS.
LIPF7F7	A loop initialization primitive frame used to acquire a valid AL_PA.
LIPF8F7	A loop initialization primitive frame used to indicate that a loop failure has been detected at the receiver.
Link Failures	Number of optical link failures detected by this port. A link failure is a loss of synchronization for a period of time greater than the value of R_T_TOV or by loss of signal while not in the offline state. A loss of signal causes the switch to attempt to re-establish the link. If the link is not re-established by the time specified by R_T_TOV, a link failure is counted. A link reset is performed after a link failure.
Login	Time when user logged in.

Table B-11. Show Port Parameters (Continued)

Entry	Description
Logout	Time when user logged out.
LoopTimeouts	A two (2) second timeout as specified by FC-AL-2.
LossOfSync	Number of synchronization losses (>100 ms) detected by this port. A loss of synchronization is detected by receipt of an invalid transmission word.
PrimSeqErrors	Primitive sequence errors detected.
RxLinkResets	Number of link reset primitives received from an attached device.
RxOfflineSeq	Number of offline sequences received. An OLS is issued for link initialization, a Receive & Recognize Not_Operational (NOS) state, or to enter the offline state.
TotalErrors	Total number of errors detected.
TotalLIPsRecvd	Number of loop initialization primitive frames received by this port.
TotalLinkResets	Total number of link reset primitives.
TotalOfflineSeq	Total number of Offline Sequences issued by this port.
TotalRxFrames	Total number of frames received by this port.
TotalRxWords	Total number of words received by this port.
TotalTxFrames	Total number of frames issued by this port.
TotalTxWords	Total number of words issued by this port.
TxLinkResets	Number of Link Resets issued by this port.
TxOfflineSeq	Total number of Offline Sequences issued by this port.
TxWait	Time waiting to transmit when blocked with no credit. Measured in FC Word times

setup [option]

Displays setup attributes for the system, SNMP, and the switch manufacturer.
Refer to the ["Show Setup Command" on page B-53](#).

steering [domain_id]

Displays the routes that data takes to the switch given by [domain_id]. If you omit [domain_id], the system displays routes for all switches in the fabric.

switch

Displays switch operational information.

topology

Displays all connected devices.

users

Displays all user logins.

Examples

The following is an example of the Show Chassis command:

```
SANbox2 $> show chassis
```

```
Chassis Information
-----
BoardTemp (1) - Degrees Celsius    32
BoardTemp (2) - Degrees Celsius    36
FanStatus (1)                      Good
FanStatus (2)                      Good
PowerSupplyStatus (1)              Good
PowerSupplyStatus (2)              Good
```

The following is an example of the Show Domains command:

```
SANbox2 $> show domains
```

```
Principal switch is (local): 10:00:00:c0:dd:00:90:6b

Domain ID List:
    Domain 22 (0x16)          WWN = 10:00:00:c0:dd:00:90:6b
```

The following is an example of the Show Fabric command:

```
SANbox2 $> show fabric
```

Switch ID	WWN	NodeIPAddress	PortIPAddress	SymbolicName
100	fffc64	10:00:00:60:69:20:4c:a2		
103	fffc67	10:00:00:c0:dd:00:b9:09		
104	fffc68	10:00:00:c0:dd:00:b8:4b		

The following is an example of the Show Setup SNMP command:

```
SANbox2 $> show setup snmp
```

SNMP Information

Contact	Technical Support
Location	TSLab
Description	QLogic SANbox2 FC Switch
Trap1Enabled	True
Trap1Address	10.20.71.15
Trap1Port	162
Trap1Severity	warning
Trap2Enabled	False
Trap2Address	0.0.0.0
Trap2Port	162
Trap2Severity	warning
Trap3Enabled	False
Trap3Address	0.0.0.0
Trap3Port	162
Trap3Severity	warning
Trap4Enabled	False
Trap4Address	0.0.0.0
Trap4Port	162
Trap4Severity	warning
Trap5Enabled	False
Trap5Address	0.0.0.0
Trap5Port	162
Trap5Severity	warning
ObjectID	1.3.6.1.4.1.1663.1.1.1.1.11
AuthFailureTrap	False

The following is an example of the Show Topology command:

```
SANbox2 $> show topology
```

Unique ID Key

A = ALPA, D = Domain ID, P = Port ID

Port Number	Local Type	Local PortWWN	Remote Type	Remote NodeWWN	Unique ID
-----	-----	-----	-----	-----	-----
0	E	20:00:00:c0:dd:00:c2:d6	E	10:00:00:c0:dd:00:b9:fd	1(0x1) D
1	F	20:01:00:c0:dd:00:c2:d6	N	50:00:60:e8:02:a0:f8:16	020100 P
2	F	20:02:00:c0:dd:00:c2:d6	N	20:00:00:e0:8b:05:0f:64	020200 P
3	F	20:03:00:c0:dd:00:c2:d6	N	20:00:00:e0:8b:05:0a:64	020300 P
4	F	20:04:00:c0:dd:00:c2:d6	N	20:00:00:e0:8b:07:69:6d	020400 P
5	F	20:05:00:c0:dd:00:c2:d6	N	20:01:00:e0:8b:27:69:6d	020500 P
6	F	20:06:00:c0:dd:00:c2:d6	N	20:00:00:e0:8b:05:0c:64	020600 P
7	F	20:07:00:c0:dd:00:c2:d6	N	20:00:00:e0:8b:05:0b:64	020700

The following is an example of the Show Topology (for Port #1) command:

```
SANbox2 #> show topology 1
```

Local Link Information

PortNumber 1

PortID 020100

PortWWN 20:01:00:c0:dd:00:c2:d6

PortType F

Remote Link Information

Device 0

PortID 020100

PortWWN 50:00:60:e8:02:a0:f8:16

NodeWWN 50:00:60:e8:02:a0:f8:16

PortType N

Description (NULL)

IPAddress 0.0.0.0

The following is an example of the Show Port command:

SANbox2 \$> show port 3

Port Number: 3

AdminState	Online	OperationalState	Offline
AsicNumber	1	PortID	050300
AsicPort	3	PortWWN	20:03:00:c0:dd:00:90:6b
ConfigType	GL	RunningType	Unknown
DiagStatus	Passed	SFPPartNumber	Unknown
EpConnState	None	SFPRevision	0
EpIsoReason	NotApplicable	SFPType	NotInstalled
LinkSpeed	Auto	SFPVendor	Unknown
LinkState	Inactive	SFPVendorID	0
LoginStatus	NotLoggedIn	SymbolicName	Port3
MaxCredit	12	SyncStatus	SyncLost

ALInit	1	FReject	0	RxLinkResets	0
ALInitError	0	InvalidCRC	0	RxOfflineSeq	0
Class2FramesIn	0	InvalidDestAddr	0	TotalErrors	0
Class2FramesOut	0	LIP_AL_PD_AL_PS	0	TotalLIPsRecvd	0
Class2WordsIn	0	LIP_F7_AL_PS	0	TotalLinkResets	0
Class2WordsOut	0	LIP_F7_F7	0	TotalOfflineSeq	2
Class3FramesIn	0	LIP_F8_AL_PS	0	TotalRxFrames	0
Class3FramesOut	0	LIP_F8_F7	0	TotalRxWords	0
Class3Toss	0	LinkFailures	0	TotalTxFrames	0
Class3WordsIn	0	Login	0	TotalTxWords	0
Class3WordsOut	0	Logout	0	TxLinkResets	0
DecodeError	0	LoopTimeouts	0	TxOfflineSeq	2
FBusy	0	LossOfSync	0	TxWait	0
FlowErrors	0	PrimSeqErrors	0		

The following is an example of the Show Switch command:

```
SANbox2 $> show switch
Switch Information
-----
SymbolicName                SANbox2
SwitchWWN                   10:00:00:c0:dd:00:c2:d6
SwitchType                   Sanbox2-8
PROMVersion                  V0.4-0-0   (Wed Jul 24 23:58:34 2002)
CreditPool                  0
DomainID                    2 (0x2)
FlashSize - MBytes          128
LogLevel                     Critical
MaxPorts                     8
NumberOfAsics                1
NumberOfPortsPerAsic        16
NumberOfResets               11
ReasonForLastReset           NormalReset
SWImageVersion (1) - build date V1.4-7-6   (Tue Jul 30 03:53:06 2002)
SWImageVersion (2) - build date V1.3-47-0   (Wed Jul 24 23:58:34 2002)
ActiveConfiguration          config-g
ActiveSWImage                 2
AdminState                   Online
AdminModeActive              False
BeaconOnStatus               False
OperationalState             Online
PrincipalSwitchRole          False
BoardTemp (1) - Degrees Celsius 28
BoardTemp (2) - Degrees Celsius 28
SwitchDiagnosticsStatus      Passed
SwitchTemperatureStatus      Normal
```

Show Config Command

Display switch and port attributes for the active configuration.

Authority User

Syntax **show config**
port *[port_number]*
switch
zoning

Keywords **port [port_number]**
Displays configuration parameters for the port number given by [port_number]. Ports are numbered beginning with 0. If the port value is omitted, all ports are specified.

switch
Displays configuration parameters for the switch.

zoning
Displays zoning configuration parameters for the switch.

Examples The following is an example of the Show Config Port command:

```
SANbox2 $> show config port 3
```

```
Configuration Name: default
```

```
-----
```

```
Port Number: 3
```

```
-----
```

AdminState	Online
LinkSpeed	Auto
PortType	GL
TLPortMode	TLInitiatorMode
ISLSecurity	Any
SymbolicName	Port4
ALFairness	False
ARB_FF	False
InteropCredit	0
FanEnable	True
ExtCredit	0
FanEnable	False
LCFEnable	False
MFSEnable	False
MFS_TOV	640
MSEnable	False
NoClose	False
IStreamGuard	False

```

VIEnable      False
CheckAlps     False

```

The following is an example of the Show Config Switch command:

```
SANbox2 $> show config switch
```

```
Configuration Name: default
```

```
-----
```

```
Switch Configuration Information
```

```
-----
```

```

AdminState      Online
BroadcastEnable  False
DomainID        11
DomainIDLock    True
SymbolicName    bottom switch
R_T_TOV         100
R_A_TOV         10000
E_D_TOV         2000
FS_TOV          5000
DS_TOV          5000
PrincipalPriority 254
Description

```

The following is an example of the Show Config Zoning command:

```
SANbox2 $> show config zoning
```

```
Configuration Name: default
```

```
-----
```

```
Zoning Configuration Information
```

```
-----
```

```

AutoSave      True
Default       All
Merge Mode    SW2

```

Show Log Command

Displays the contents of the log or the parameters used to create entries in the log. The log contains a maximum of 200 entries. When the log reaches its entry capacity, subsequent entries overwrite the existing entries, beginning with the oldest.

Authority User

Syntax **show log**
 component
 level
 options
 port
 settings

Keywords **component**

Displays the components currently being monitored for events.

level

Displays the event severity level needed to create an entry in the log. If the severity level occurs on a port or on a component which is not defined, no entry is made in the log.

options

Displays the options used to set the component and log level attributes.

port

Displays the ports being monitored for events. If an event occurs which is of the defined level and on a defined component, but not on a defined port, no entry is made in the log.

settings

Displays the current settings for component, level and port. This command is equivalent to executing the following commands separately: Show Log Component, Show Log Level, and Show Log Port.

Examples The following is an example of the Show Log Component command

```
SANbox2 $> show log component
```

```
Current setting(s) for log component: NameServer
```

The following is an example of the Show Log Level command:

```
SANbox2 $> show log level
```

```
Current setting(s) for log level: Info
```

The following is an example of the Show Log Options command:

```
SANbox2 $> show log options
```

```
Allowed options for 'level': Critical,Warn,Info,None
```

```
Allowed options for 'component': All,None,NameServer,MgmtServer,Zoning,Switch,
Chassis,Blade,Port,Eport,Snmp,Other
```

The following is an example of the Show Log command:

```
[327][Wed Jan 25 09:36:54.860 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Eport
State = E_A0_GET_DOMAIN_ID]
[328][Wed Jan 25 09:36:54.860 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][FSPF
PortUp state=0]
[329][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Send
ing init hello]
[330][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Proc
essing EFP, oxid= 0x8]
[331][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Epor
t State = E_A2_IDLE]
[332][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][EFP,
WWN= 0x100000c0dd00b845, len= 0x30]
[333][Wed Jan 25 09:36:54.864 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Send
ing LSU oxid= 0xc: type= 1]
[334][Wed Jan 25 09:36:54.864 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Send
Zone Merge Request]
[335][Wed Jan 25 09:36:54.865 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][LSDB
Xchg timer set]
[336][Wed Jan 25 09:36:54.865 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Sett
ing attribute Oper.UserPort.0.8.EpConnState Connected]
```

Show Perf Command

Displays performance data for all ports.

Authority User

Syntax **show perf**
 byte [bytes/sec]
 frame [frames/sec]

Keywords **byte [bytes/sec]**
Displays port performance data for all ports in bytes/second. The display is refreshed according to the interval in seconds given by *[bytes/sec]*. If *[bytes/sec]* is omitted, the display is refreshed every second. Type “q” and press the Enter key to stop the display.

frame [frames/sec]
Displays port performance data for all ports in frames/second. The display is refreshed according to the interval in seconds given by *[frames/sec]*. If *[frames/sec]* is omitted, the display is refreshed every second. Type “q” and press the Enter key to stop the display.

Notes The Show Perf command with no keywords displays performance data in frames/second and bytes/second at that moment.

Examples The following is an example of the Show Perf Byte command:

```
SANbox2 $> show perf byte
```

```
Displaying bytes/sec data... (Press 'q' and the ENTER key to stop display)
```

	0	1	2	3	4	5	6	7

76M	0	0	32M	0	0	0	0	43M
78M	0	0	34M	0	0	0	0	43M
78M	0	0	34M	0	0	0	0	43M
77M	0	0	33M	0	0	0	0	44M
77M	0	0	33M	0	0	0	0	44M
84M	0	0	40M	0	0	0	0	43M
83M	0	0	39M	0	0	0	0	43M
80M	0	0	35M	0	0	0	0	45M
77M	0	0	33M	0	0	0	0	44M
78M	0	0	33M	0	0	0	0	44M
75M	0	0	29M	0	0	0	0	45M
74M	0	0	28M	0	0	0	0	46M

q

Show Setup Command

Displays the current SNMP and system settings.

Authority User

Syntax **show setup**
snmp
system

Keywords **snmp**
Displays the current SNMP settings.

system
Displays the current system settings.

Examples The following is an example of the Show Setup Snmp command:

```
SANbox2 $> show setup snmp
SNMP Information
-----
Contact          <sysContact undefined>
Location         <sysLocation undefined>
Description      QLogic SANBox2 FC Switch
Trap1Enabled     False
Trap1Address     10.0.0.254
Trap1Port        162
Trap1Severity    warning
Trap2Enabled     False
Trap2Address     0.0.0.0
Trap2Port        162
Trap2Severity    warning
Trap3Enabled     False
Trap3Address     0.0.0.0
Trap3Port        162
Trap3Severity    warning
Trap4Enabled     False
Trap4Address     0.0.0.0
Trap4Port        162
Trap4Severity    warning
Trap5Enabled     False
Trap5Address     0.0.0.0
Trap5Port        162
Trap5Severity    warning
ObjectID         1.3.6.1.4.1.1663.1.1.1.1.11
AuthFailureTrap  False
```

The following is an example of the Show Setup System command:

```
SANbox2 $> show setup system
```

System Information

NetworkIPAddress	172.22.11.202
NetworkIPMask	255.255.252.0
GatewayIPAddress	172.22.8.254
NetworkDiscovery	Static
AdminTimeout	30
SecurityEnable	False
RemoteLogEnable	False
LogHostIPAddress	undefined

Shutdown Command

Terminates all data transfers on the switch at convenient points and closes the Telnet session.

Authority Admin

Syntax `shutdown`

Test Command

Performs the port loopback test to verify the operation of a port. The three types of loopback tests are Internal (SerDes level), External (SFP), and Online. While the test is running, the remaining ports on the switch remain fully operational.

Authority Admin

Syntax `test [port_number] [test_type]`

Keywords `[port_number]`

Specifies the port. Ports are numbered beginning with 0.

`[test_type]`

The test type. If you omit `[test_type]`, the internal loopback test is run. `[test_type]` can be one of the following values:

cancel

Cancels online test in progress.

internal

Tests the SerDes.

external

Tests both the SerDes and SFP. Requires a loopback plug be installed in the SFP.

online

Tests one online port.

status

Displays the status of a test in progress, or if there is no test in progress, the status of the test that was executed last.

Examples To run Internal (SerDes) or External (SFP) port tests, do the following:

1. To start an Admin session, enter the following command.
`admin start`
2. Place the port in Diagnostics mode, enter the following command (`x` = port number) and press the Enter key.
`set port x state diagnostics`
3. Insert the loopback plug into the SFP on the selected port.
4. Choose one of the two types of Port Loopback Tests to run:
 - To run an internal loopback test, enter the following and press the Enter key:
`test x internal`
 - To run an external loopback test, enter the following command. A loopback plug must be installed for this test to pass.
`test x external`

5. After the test type has been chosen and the command executed, a message on the screen will appear detailing the test results.
6. After the test is run, put the port back into online state by entering the following command (x = port number) and pressing the Enter key.

```
set port x state online
```

7. To verify port is back online, enter the following command and press the Enter key. The contents of the AdminState field should display be "Online".

```
show port x
```

The online loopback (node-to-node) test can test only one port at a time, and that port must be online and connected to a remote device. To run the online loopback test, do the following:

1. To start an Admin session, enter the following command and press the Enter key.

```
admin start
```

2. To run the online loopback test, enter the following command and press the Enter key.

```
test x online
```

3. A series of test parameters are displayed on the screen. Press the Enter key to accept each default parameter value, or type a new value for each parameter and press the Enter key. The TestLength parameter is the number of frames sent, the FrameSize (256 byte maximum in some cases) parameter is the number of bytes in each frame, and the DataPattern parameter is the pattern in the payload. Before running the test, make sure that the device attached to the port can handle the test parameters.

```
SANbox2N107 (admin) #> test x online
```

A list of attributes with formatting and current values will follow. Enter a new value or simply press the ENTER key to accept the default value. If you wish to terminate this process before reaching the end of the list press 'q' or 'Q' and the ENTER key to do so.

```
TestLength      (decimal value, 1-4294967295)  [100    ]
FrameSize       (decimal value, 36-2148)       [256    ]
DataPattern     (32-bit hex value or 'Default') [Default]
StopOnError     (True/False)                   [False  ]
Do you want to start the test? (y/n) [n]
```

4. After all parameter values are defined, press the Y key to start the test.

Uptime Command

Displays the elapsed time since the switch was last reset and reset method.

Authority User

Syntax `uptime`

Examples The following is an example of the Uptime command:

```
SANbox2 $> uptime
```

```
Elapsed up time : 0 day(s), 2 hour(s), 28 min(s), 44 sec(s)  
Reason last reset: NormalReset
```

User Command

Administers or displays user accounts.

Authority Admin

Syntax **user**
accounts
add
delete [account_name]
list

Keywords **accounts**
Displays all user accounts that exist on the switch.

add
Add a user account to the switch. After this command is executed, the administrator will be prompted for the information needed to establish the user account.

delete [account_name]
Deletes the account name given by [account_name] from the switch.

list
Displays the list of users currently logged in and their session numbers. Provides the same function as the Show User command. This keyword is valid for User authority and does not require an admin session.

Examples The following is an example of the User Accounts command:

```
SANbox2 (admin) #> user accounts
```

```
Current list of user accounts
-----
admin      (admin authority = True)
user1      (admin authority = False)
user2      (admin authority = False)
user3      (admin authority = True)
```

The following is an example of the User Add command:

```
SANbox2 (admin) #> user add
```

```
Press 'q' and the ENTER key to abort this command.
```

```
account name (1-15 chars)      : user3
account password (4-20 chars) :
```

```
please confirm account password:
```

```
should this account have admin authority? (y/n) [n] : y
```

```
OK to add user account 'user3' with admin authority?  
Please confirm (y/n): [n] y
```

The following is an example of the User Delete command:

```
SANbox2 (admin) #> user del user3
```

```
The user account will be deleted. Please confirm (y/n): [n] y
```

The following is an example of the User List command:

```
SANbox2 (admin) #> user list
```

```
Current list of users logged in  
-----  
admin@OB-session1 - in admin mode  
admin@OB-session2  
user1@OB-session3
```

Whoami Command

Displays the account name, session number, and switch domain ID for the Telnet session.

Authority User

Syntax **whoami**

Examples The following is an example of the Whoami command:

```
SANbox2 $> whoami
```

```
User name:admin@session2
```

```
Switch name:SANbox2
```

```
Switch domain ID:1
```

Zone Command

Manages zones and zone membership on a switch. The Zone command defines members (ports and devices) for a single switch. Zones are members of zone sets.

Authority Admin authority within a Zoning Edit session. Refer to the ["Zoning Command" on page B-67](#). List, Members, and zone sets keywords are available with User authority and do not require a Zoning Edit session.

Syntax **zone**
add [zone] [members]
copy [zone_source] [zone_destination]
create [zone]
delete [zone]
list
members [zone]
remove [zone] [members]
rename [zone_old] [zone_new]
type [zone] [*zone_type*]
zonesets [zone]

Keywords **add [zone] [members]**
Specifies one or more ports given by [members] to add to the zone named [zone].
. [members] can have one of the following formats:

- Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.
- 6-character device Fibre Channel address (hex)
- 16-character hexadecimal worldwide port name (WWPN) with the format xx:xx:xx:xx:xx:xx:xx:xx.
- Alias name

The application verifies that the [zone] format is correct, but does not validate that such a port exists

copy [zone_source] [zone_destination]

Creates a new zone named [zone_destination] and copies the membership into it from the zone given by [zone_source].

create [zone]

Creates a zone with the name given by [zone]. The zone name can have a maximum of 64 alpha-numeric characters without spaces.

delete [zone]

Deletes the specified zone given by [zone] from the zoning database. If the zone is a member of the active zone set, the zone will not be removed from the active zone set until the active zone set is deactivated.

list

Displays a list of all zones and the zone sets of which they are members. This keyword is valid for User authority and does not require a zoning edit session.

members [zone]

Displays all members of the zone given by [zone]. This keyword is available with User authority and does not require a Zoning Edit session.

remove [zone] [members]

Removes the ports given by [members] from the zone given by [zone]. The [members] can have one of the following formats:

- Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.
- 6-character device Fibre Channel address (hex)
- 16-character hexadecimal worldwide port name (WWPN) with the format xx:xx:xx:xx:xx:xx:xx:xx.
- Alias name

rename [zone_old] [zone_new]

Renames the zone given by [zone_old] to the zone given by [zone_new].

type [zone] [zone_type]

Specifies the zone type given by [zone_type] to be assigned to the zone name given by [zone]. If you omit the [zone_type], the system displays the zone type for the zone given by [zone]. [zone_type] keyword can be one of the following:

soft
Name server zone

hardacl
Access control list hard zone

hardvpf
Virtual private fabric hard zone

zonesets [zone]

Displays all zone sets of which the zone given by [zone] is a member. This keyword is available with User authority and does not require a Zoning Edit session.

Examples

The following is an example of the Zone List command:

```
SANbox2 $> zone list
```

```
Zone          ZoneSet
-----
wwn_b0241f
              zone_set_1

wwn_23bd31
```

```
zone_set_1

wwn_221416
zone_set_1

wwn_2215c3
zone_set_1

wwn_0160ed
zone_set_1

wwn_c001b0
zone_set_1

wwn_401248
zone_set_1

wwn_02402f
zone_set_1

wwn_22412f
zone_set_1
```

The following is an example of the Zone Members command:

```
SANbox2 $> zone members wwn_b0241f
```

```
Current List of Members for Zone: wwn_b0241f
-----
50:06:04:82:bf:d2:18:c2
50:06:04:82:bf:d2:18:d2
21:00:00:e0:8b:02:41:2f
```

The following is an example of the Zone Zonesets command:

```
SANbox2 $> zone zonesets zone1
```

```
Current List of ZoneSets for Zone: wwn_b0241f
-----
zone_set_1
```

Zoneset Command

Manages zone sets and zone set membership across the fabric.

Authority Admin authority within a Zoning Edit session. Refer to the ["Zoning Command" on page B-67](#). Active, List, Zones keywords are available with User authority. You must close the Zoning Edit session before using the Activate and Deactivate keywords.

Syntax

```

zoneset
  active
  activate [zone_set]
  add [zone_set] [zone_list or alias]
  copy [zone_set_source] [zone_set_destination]
  create [zone_set]
  deactivate
  delete [zone_set]
  list
  remove [zone_set] [zone_list or alias]
  rename [zone_set_old] [zone_set_new]
  zones [zone_set]
  
```

Keywords

active
Displays the name of the active zone set. This keyword is available with User authority and does not require a Zoning Edit session.

activate [zone_set]
Activates the zone set given by [zone_set]. This keyword deactivates the active zone set. Close the Zoning Edit session before using this keyword.

add [zone_set] [zone_list or alias]
Adds one or more zones given by [zone_list] to the zone set given by [zone]. [zone_list] can be an alias. This keyword requires a Zoning Edit session.

copy [zone_set_source] [zone_set_destination]
Creates a new zone set named [zone_set_destination] and copies into it the membership from the zone set given by [zone_set_source]. This keyword requires a Zoning Edit session.

create [zone_set]
Creates the zone set with the name given by [zone_set]. A zone set name can have a maximum of 64 alpha-numeric characters without spaces. This keyword requires a Zoning Edit session.

deactivate
Deactivates the active zone set. Close the Zoning Edit session before using this keyword.

delete [zone_set]
Deletes the zone set given by [zone_set]. If the specified zone set is active, the command is suspended until the zone set is deactivated. This keyword requires a Zoning Edit session.

list

Displays a list of all zone sets. This keyword is available with User authority and does not require a Zoning Edit session.

remove [zone_set] [zone_list]

Removes one or more zones given by [zone_list] from the zone set given by [zone_set]. If [zone_set] is the active zone set, the zone will not be removed until the zone set has been deactivated. [zone_list] can be an alias. This keyword requires a Zoning Edit session.

rename [zone_set_old] [zone_set_new]

Renames the zone set given by [zone_set_old] to the name given by [zone_set_new]. You can rename the active zone set. This keyword requires a Zoning Edit session.

zones [zone_set]

Displays all zones that are members of the zone set given by [zone_set]. This keyword is available with User authority and does not need a Zoning Edit session.

Notes

- A zone set must be active for its definitions to be applied to the fabric.
- Only one zone set can be active at one time.
- A zone can be a member of more than one zone set.

Examples

The following is an example of the Zoneset Active command:

```
SANbox2 $> zoneset active
```

```
The active ZoneSet is: Beta
```

The following is an example of the Zoneset List command:

```
SANbox2 $> zoneset list
```

```
Current List of ZoneSets
-----
alpha
beta
```

The following is an example of the Zoneset Zones command:

```
SANbox2 $> zoneset zones ssss
```

```
Current List of Zones for ZoneSet: ssss
-----
zone1
zone2
zone3
```

Zoning Command

Opens a Zoning Edit session in which to create and manage zone sets and zones. Refer to the ["Zone Command" on page B-62](#) and the ["Zoneset Command" on page B-65](#).

Authority Admin. The List keyword is available with User authority.

Syntax **zoning**
 cancel
 clear
 edit
 list
 restore
 save

Keywords **cancel**
Closes the current Zoning Edit session. Any unsaved changes are lost.

clear
Clears all zoning definitions in the volatile edit copy of the zoning database. This keyword does not affect the non-volatile zoning database. However, if you enter the Zoning Clear command followed by the Zoning Save command, the non-volatile zoning database will be cleared from the switch. The preferred method for clearing the zoning database from the switch is the Reset Zoning command.

edit
Opens a Zoning Edit session.

list
Lists all fabric zoning definitions. This keyword is available with User authority.

restore
Reverts the changes applied to the zoning database with the Zoning Save command.

save
Saves changes made during the current Zoning Edit session. The system will inform you that the zone set must be activated to implement any changes. This does not apply if you entered the Zoning Clear command during the Zoning Edit session.

Examples The following is an example of the Zoning Edit command:

```
SANbox2 $> admin start

SANbox2 (admin) #> zoning edit

SANbox2 (admin-zoning) #>
.
.
SANbox2 (admin-zoning) #> zoning cancel

Zoning edit mode will be canceled. Please confirm (y/n): [n] y

SANbox2 (admin) #> admin end
```

The following is an example of the Zoning List command:

```
SANbox2 $> zoning list

Active ZoneSet Information

ZoneSet      Zone      ZoneMember
-----
wwn

      wwn_b0241f
          50:06:04:82:bf:d2:18:c2
          50:06:04:82:bf:d2:18:d2
          21:00:00:e0:8b:02:41:2f

      wwn_23bd31
          50:06:04:82:bf:d2:18:c2
          50:06:04:82:bf:d2:18:d2
          10:00:00:00:c9:23:bd:31

      wwn_221416
          50:06:04:82:bf:d2:18:c2
          50:06:04:82:bf:d2:18:d2
          10:00:00:00:c9:22:14:16

      wwn_2215c3
          50:06:04:82:bf:d2:18:c2
          50:06:04:82:bf:d2:18:d2
          10:00:00:00:c9:22:15:c3
```

Configured Zoning Information

ZoneSet	Zone	ZoneMember

wwn		
	wwn_b0241f	
		50:06:04:82:bf:d2:18:c2
		50:06:04:82:bf:d2:18:d2
		21:00:00:e0:8b:02:41:2f
	wwn_23bd31	
		50:06:04:82:bf:d2:18:c2
		50:06:04:82:bf:d2:18:d2
		10:00:00:00:c9:23:bd:31
	wwn_221416	
		50:06:04:82:bf:d2:18:c2
		50:06:04:82:bf:d2:18:d2
		10:00:00:00:c9:22:14:16
	wwn_2215c3	
		50:06:04:82:bf:d2:18:c2
		50:06:04:82:bf:d2:18:d2
		10:00:00:00:c9:22:15:c3

Notes

Glossary

Activity LED

A port LED that indicates when frames are entering or leaving the port.

Alias

A collection of objects that can be zoned together. An alias is not a zone, and can not have a zone or another alias as a member.

AL_PA

Arbitrated Loop Physical Address

Arbitrated Loop

A Fibre Channel topology where ports use arbitration to establish a point-to-point circuit.

Arbitrated Loop Physical Address (AL_PA)

A unique one-byte valid value assigned during loop initialization to each NL_Port on a Loop.

ASIC

Application Specific Integrated Circuit

BootP

A type of network server.

Buffer Credit

A measure of port buffer capacity equal to one frame.

Class 2 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports with acknowledgment provided.

Class 3 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports without acknowledgment.

Domain ID

User defined name that identifies the switch in the fabric.

E_Port

Expansion port. A switch port that connects to another FC-SW-2 compliant switch.

Expansion Port

See E_Port.

Fabric Management Switch

The switch through which the fabric is managed.

Fabric Name

User defined name associated with the file that contains user list data for the fabric.

Fan Fail LED

An LED that indicates that a cooling fan in the switch is operating below standard.

FC-PLDA

Fibre Channel Private Loop Direct Attach

Flash Memory

Memory on the switch that contains the chassis control firmware.

Frame

Data unit consisting of a start-of-frame (SOF) delimiter, header, data payload, CRC, and an end-of-frame (EOF) delimiter.

FRU

Field Replaceable Unit

Heartbeat LED

A chassis LED that indicates the status of the internal switch processor and the results of the Power-On Self-Test.

Initiator

The device that initiates a data exchange with a target device.

In-Order-Delivery

A feature that requires that frames be received in the same order in which they were sent.

Input Power LED

A chassis LED that indicates that the switch logic circuitry is receiving proper DC voltages.

IP

Internet Protocol

LIP

Loop Initialization Primitive

Logged-In LED

A port LED that indicates device login or loop initialization status.

Management Information Base

A set of guidelines and definitions for the Fibre Channel functions.

Management Workstation

PC workstation that manages the fabric through the fabric management switch.

MIB

Management Information Base

NL_Port

Node Loop Port. A fibre channel device port that supports arbitrated loop protocol.

N_Port

Node Port. A fibre channel device port in a point-to-point or fabric connection.

Over Temperature LED

A chassis LED or a power supply LED that indicates that the switch or power supply is overheating.

POST

Power On Self Test

Power On Self Test (POST)

Diagnostics that the switch chassis performs at start up.

Private Device

A device that can communicate only with other devices on the same loop.

Private Loop

A loop of private devices connected to a single switch port.

SANbox Manager

Switch management application.

SFP

Small Form-Factor Pluggable transceiver

Small Form-Factor Pluggable Transceiver

A transceiver device, smaller than a Gigabit Interface Converter, that plugs into the Fibre Channel port.

SNMP

Simple Network Management Protocol

Target

A storage device that responds to an initiator device.

VCCI

Voluntary Control Council for Interference

Worldwide Name (WWN)

A unique 64-bit address assigned to a device by the device manufacturer.

WWN

Worldwide Name

Zone

A named set of ports or devices that can communicate with each other.

Zone Set

A named set of zones. The active zone set defines the zoning for a fabric.

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